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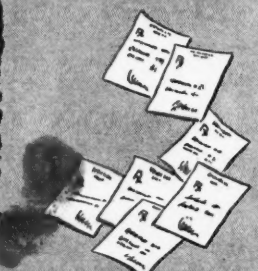

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ILLINOIS MEDICAL JOURNAL

THE OFFICIAL ORGAN OF
THE ILLINOIS STATE MEDICAL SOCIETY

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Editorials

"IF THIS BE TREASON . . ."

Is the American Medical Association a trust? Yes, it is — a sacred "trust." From its very beginning the A.M.A. has considered the health of the American people above all else. It led the fight against diploma mills, and through its efforts medical education was placed on its present high plane. The A.M.A. was instrumental in raising the standards of hospitals so that today American hospitals are the finest in the world. It has striven continuously to give the American people the best quality of medical care that the people of any great nation enjoy. But, because it does not fall in line with all the schemes proposed for the distribution of medical care, the A.M.A. must now be purged.

We say, in the words of Patrick Henry, "If this be treason, make the most of it!"—*Milwaukee Medical Times.*

HAPPY NEW YEAR

A new year is upon us. And so is a new era. The old era is quickly melting into oblivion. The era of reason is being supplanted by the era of might. The era of liberty is evolving with the era of slavery. The era of individualism is being transformed into an era of collectivism. This new era cannot endure. For a time it will exact its toll, wars, slavery, brute force and knavery will predominate. But an enlightened people, having learned that no material progress can be gained from the preachments and encroachments of dictators, will overturn the false leaders who have usurped power.

At the outset of the New Year in a world torn by an ever spreading war, we find ourselves at the beginning of a new era as a result of profound changes wrought by hostilities.

During the New Year we hope to see the overcoming of hatred, banishment of suspicion, rejection of the theory that force creates right, abolition of economic conflict and eradication of world egoism whereby state violate the liberties due their citizens.

In this world of turmoil medical affairs cannot remain stationary. American medicine cannot rest on laurals won or achievements gained. We should realize that there are numerous war problems to be thought of and worked out. We must realize that we are in the presence of a great social and economic upheaval, that nations are being made, unmade and remade. That the medical profession will to a great degree be caught in the sweep of forces beyond its control; that it is potent and responsible for the part it shall play in the new order of things. For all of us it is bound to be a strenuous time of readjustment; it is also an unequal time for surveying the future of medicine and formulating plans for rational development.

American Medicine has always been progressive. There is not a single doctor in the United States who would not willingly alter his method of practice, even unto a sacrifice to himself, were he convinced that political medicine would be for the best interest of the public. Facts from countries having political medicine do not however, prove the point on the subject. Death rates from every cause of death as well as the life expectancy of the American problems, prove graphically that the American way is still the best way.

The established American way of giving medical service should not be discontinued to make way for a new one that has been a failure in European countries and has brought about a lower standard of medical service to the people. Such a shift cannot be called progress. It is simply grasshopper activity. To dignify it with the name of experimentation is an insult to scientific procedure.

Every alert, sincere and practical physician has given many serious hours of study to the problem of preserving the American system of medical care. Practical experience tells us that we must act and act quickly or all of this Nation's established values in medicine and all professions and industries and even the daily comings and goings of its people are apt to be dictatorially and tyrannically regimented.

And the best way to have it a felicitous twelvemonth is for every doctor in Illinois to set about making it so through concerted effort that will force the laity to keep its hands off the practice of medicine; stem the tide surging towards socialization of medicine; regain an economic balance; end the menace of Universities practicing in competition with their own graduates and of all foundations and corporations and institutions practicing medicine and settle once and for all the question of part pay clinics and political jobbery in the control of the medical profession.

"Self help is best help."

We modern men must learn this lesson that built the country; and take to heart the axioms with which our forefathers conquered the wilderness, and survived in spite of the aborigines.

This industrial chaos sweeping the world is no greater a burden than were those that were borne by the early settlers and the heroic Jesuit missionaries that first explored and helped to settle the fertile Mississippi Valley for the King of France. "What man has done man may do." Are we grown so chicken hearted that we shall throw up the sponge and deliver ourselves up to socialization, state medicine and the sovietization of this our native land.

What travesty to the memory of those pioneer doctors who knew none of our modern aids to therapy or surgery! What travesty to manhood generally!

Let us rather adopt that firm resolve of the World War that stemmed the invaders in an almost irresistible rush—

"THEY SHALL NOT PASS!"

The birthright of generations yet to come lies in our keeping. We dare not be false to the trust, either to posterity or to the mother science. No one will do this work for us but ourselves. We must tend our own bivouac.

And in the doing, as in the doing of all duty, as in the daily sacrifice of every practicing physician's life, will come a reward greater to the doctors, and will accrue a finer salvation for the world of men than can be bought by all the millions and all the commissions of all the self aggregated dictators and misguided millionaire philanthropists that even a most prosperous America might breed.

Yet it must be admitted that out of all the grief and catastrophe and irrevocable woe left in the wake of the year 1940 it was not devoid of a few gifts for mankind. Nothing in all this mundane sphere is so evil as not to learn at least the lesson of terrible example. Out of the chaos and confusion of 1940 has come to the medical profession a reawakened consciousnes of the duties of the members of the profession to the

mother science, to themselves and to the general public, as well as to our native land, honeycombed as it is by socialistic theorists, and a self-exploiting band of lay philanthropists. But if the year 1940 proved only too bitterly the "winter of our discontent" we can at least pause and remember "If winter comes, can spring be far behind?"

And so, both for men and medicine the year 1941 we hope holds promise of happiness, prosperity and patriotism regained.

ILLINOIS STATE MEDICAL SOCIETY

Creation of three decades of struggle.

The story of the attempt to organize in Illinois a medical society which should regulate the practice of medicine and subdue quackery begins in the early days of the nineteenth century. Possible significance for the profession of 1941 may justify its retelling.

State legislation was the instrument which set up the first medical districts in Illinois. Here Dr. John Todd obtained his initial experience in medical organization, culminating two decades later, after the state-controlled experiments failed, in Todd's fathering of the State Medical Society formed in Springfield in 1840. This group, working as private individuals, accomplished what previous legislation had failed to do — it aroused the interest of the profession to a point which made possible a really statewide representation at the Convention of 1850.

The dual struggle to organize the medical profession of the state and procure legislation in its behalf, in which victory was not achieved until the second half of the century, began in 1817.

At Vincennes, Illinois Territory, a few energetic members of the profession, among whom may have been Doctors Laffont, Tisdale and Scull, besides the army surgeons Elliot and McKee, were said to have formed a society in 1817, which was recorded to have held its last meeting in 1819.

The Medical Practice Law "for the purpose of regulating the practice of physics and surgery" appeared in the Laws of the Illinois Territory of 1817-18. Under the provisions of this act, the third principal meridian was the dividing line for the two medical districts ordered formed.

At Carmi, in the eastern district, were to meet Doctors J. D. Wolverton, J. E. Throgmorton, Thomas Shannon, Henry Oldham, James Witson, John Reid, Amos Chipp, Samuel R. Campbell and Harden M. Weatherford.

Doctors Joseph Bowers, John Todd, Hancock, Cairns, George Fisher, William L. Reynolds, Heath, George Cadwell and Paine of Kaskaskia were to meet in this city in May, 1818, to form the western section. Ten dollars was to be the fee for examining students and giving diplomas.

Apparently this law was ineffective or not carried out at all, since less than four months after Illinois attained her statehood, the Legislature enacted an Act for the Establishment of Medical Societies, dated March 24, 1819 and signed by the state's first governor, Shadrach Bond. This Act placed the burden of responsibility for regulating practice upon the medical profession itself.

A new division provided for four medical districts where a board of physicians was to gather on the second Monday of the following May and incorporate. Belleville, Brownsville, Shawneetown and Palmyra were the meeting places designated.

The members were to elect officers, appoint a committee of five to examine students, grant diplomas (for which a fee of ten dollars was to be charged) and disqualify physicians from collecting debts if they had not obeyed the Act's provisions.

Each physician was to keep an accurate account of all births, deaths and diseases for transmission to the president of the society, whose duty it was to publish a record in one or more newspapers of the state. The punishment for failure or refusal was the imposition of a $10 fine. Absence without cause from the May meeting cost the culprit another $5.

Section II of the Act provided for examination of bills considered exhorbitant by the patient.

The aforementioned measure, championed in the Legislature by Dr. George Cadwell, was repealed in 1821. In February, 1823 "An Act Regulating Physicians" passed the Senate, but ultimately failed. In 1824 the matter of again organizing the medical profession under state control came before the Legislature.

Finally on January 15, 1825, Mr. Nicholas Hansen introduced an "Act Prescribing the Mode of Licensing Physicians," which was passed by the General Assembly. It created five districts with a board of censors in each which

should have power to grant licenses. Carrollton, Belleville, Golconda, Albion and Mt. Vernon were named the centers of the five districts respectively.

The bitter antagonism throughout the state toward the medical profession caused the next Legislature to repeal the Act of 1825. It likewise mainifested itself by the passage on January 3, 1825 of an "Act to Prevent the Disinterment of the Dead" to hinder physicians and surgeons from using cadavers for dissection purposes. One must conclude that "body-snatching," a recurring cause of controversy between doctors and citizens after the founding of the several Illinois medical colleges in the 1840's, was prevalent in the state at a very early date.

For eight years continuous efforts had been put forth to reform the medical situation, which was sufficiently unsatisfactory as to have aroused popular protest, reflected by frequent references in the press to the "deplorable conditions of quackery."

In spite of genuine efforts to carry out at least the Law of 1819, the net results as regards medical organization were exactly nil. However, there is adequate proof that two districts set up under this Act attempted to carry out its provisions.

The Edwardsville *Spectator* of April 25, 1820 carried the following notice, "The first district medical society of the state of Illinois will convene in Edwardsville on the second Monday of May next," signed by John Todd, president. Apparently interest lagged, for on October 10 the *Spectator* contained a more urgent notice to the effect that "the society composed of the first medical district will meet at Edwardsville the second Monday of November next at 10 o'clock, a.m., agreeable to previous adjournment. It is hoped that the importance of this meeting being well known will be sufficient inducement to cause a punctual attendance of the members —," signed by Dr. Todd's partner, Dr. Samuel G. J. De Camp. Repeated on October 17, 24 and 31, 1820 is the identical notice.

Announcement of the "Annual Meeting of the First District Society of the State of Illinois at Edwardsville," signed by Henry Perrine, Secretary, and requesting punctual attendance, appeared in April, 1821.

Perhaps the chief interest for the historian lies in the fact that Dr. John Todd's activity as a medical organizer appears early in the annals of the state. His was a life-long conviction in the necessity for group cooperation to protect professional interests. Twenty years later we find his name occurring again as president of the State Medical Society.

The second medical district was likewise active as evidenced by a report, printed May 29, 1820, to Dr. William L. Reynolds of the Kaskaskia Medical Society from Dr. Hugh Steel of Brownsville, describing health conditions in Jackson County.

In spite of the crying need for reform in a state where an apprenticeship of a year or two with a country practitioner or in the shop of an ignorant apothecary, or at most a superficial course of study at some medical college, qualified a man to become a doctor, another decade passed before the next recorded attempt to form a medical society. This was occasioned by the arrival in Chicago of Dr. Levi Boone, grandnephew of the storied Daniel, who migrated from Hillsboro, Illinois in the spring of 1836.

Most significant is the fact that after obtaining his M.D. from Transylvania, Dr. Boone located at Edwardsville, possibly in the late 1820's, where he must have known and been inspired by Dr. John Todd.

As a direct result of the newcomer's efforts to awaken Chicago physicians to dangers of the lack of organization, the first Cook County Medical Society was born. The state census of 1835 listed 14 physicians in Chicago, so that the addition of Dr. Boone, and possibly one or two other members of the medical confraternity, made a sufficiently large group from which to create an active society in 1836.

At that date, Chicago boasted two newspapers, the *American,* a semi-weekly, and the *Democrat,* a weekly, the latter edited for a time by Dr. Daniel Brainard, the energetic founder of Rush Medical College. The October first issue of both papers contained a notice to the press, under the title "Improvement of Medical Science," of the purpose and aims of the Society, given by Dr. Boone as Secretary, and announcing a meeting for "Monday evening next." Andreas, in his *History of Chicago, Illinois,* records that this meeting took place in the office of the Chicago Marine and Fire Insurance Company, of which Dr. Boone was also secretary.

This group, too, soon dissolved, it seems, for no further record of its activities remain. The two contributing factors were doubtless the financial panic of 1837 and the drouth of the same year, which caused residents of Chicago to put themselves on short rations and disease to carry off many of the inhabitants. Genuine suffering prevailed among all classes, probably dwarfing the importance of medical organization at this time.

There came into being in 1840 at Springfield the State Medical Society under the presidency of Dr. John Todd. Its existence is attested by the call, published in the *Illinois State Journal* of Friday, June 19, 1840, and a membership certificate isued to Dr. Thomas W. Hennessey of La Salle, under the date of February 27, 1841.

Whether or not the State Medical Society felt the need of Legislative support for its program we do not know; but at any rate, in spite of previous discouragements along this line, in 1842 there was brought before the General Assembly "An Act to Incorporate the Illinois State Medical Society" and regulate the practice of medicine, which Act was tabled.

The Convention of 1850, which resulted in the formation of the Illinois State Medical Society, was the culmination of a new series of attempts at medical organization, beginning in 1846.

The founding of Rush Medical College in 1843, the appearance of the *Illinois Medical Journal* in 1844, the adoption of a National Code of Medical Ethics by the recently established National Medical Association, the enthusiasm of Drs. N. S. Davis, Brainard and others imbued with their spirit — all gave impetus to the movement which resulted in four new local groups exerting an especial influence toward State organization. The Rock River Valley Medical Society, dating from 1846, the Lawrenceville Aesculapian Medical Society, incorporated in 1847, the Peoria District Medical Society, founded in 1848, and the Ottawa Medico-Chirurgical Society of 1849 comprised the list of new societies.

An article on "State Legislation Respecting Medical Practice," published in the *Illinois Medical and Surgical Journal* for October, 1844 states: "If it should be thought desirable to have medical societies incorporated, we have no objection to this course, as it has reference to the profession and its improvement. ..... If there were organized medical societies from which such persons (quacks) were excluded, it would act as a powerful check on their pretensions."

While apparently the article took no cognizance of the State Medical Society then functioning in Springfield, we must remember that it drew its membership from the central and southern sections only of the state, due largely to inconveniences of travel in those days. Naturally the growing group of practitioners in Chicago were eager for an organization more state-wide in character.

The first of the new groups to be formed was the Rock River Valley Medical Society, which met at Rockford on February 17, 1846 and elected Dr. J. C. Goodhue president. Its field was northern Illinois and the southern portion of the Wisconsin Territory.

One noteworthy event of its second meeting, held on the 19th of the following May, was the presence of Dr. Daniel Brainard, who had traveled from Chicago by private conveyance for the purpose of becoming a member of the Society, Chicago at that date having no group of its own. Among its members who later acquired distinction were Drs. Ames, Catlin, The Clarks, Everett, Ephraim Ingals, Martin, Paddock, Ransom and Welch.

Far to the southeast, four energetic men, David Adams, J. M. Doyle, Elisha Banks and Charles Hamilton, got together in the town of Lawrenceville sometime during 1846 and founded one of the strongest local medical organizations of the state. On February 17, 1847 it became a regularly chartered institution, incorporated as the "Lawrenceville Aesculapian Medical Society." Later on, due to the fact that members from other counties began to meet with the original founders, the society changed its name to the "Aesculapian Society of the Wabash Valley" (1893).

In the early days, attendance at its meetings required the busy physician to sacrifice nearly a week of his valuable time, for its sessions extended through Wednesday and Thursday, and one full day was required to go and return. Its purpose is clearly stated in the *Transactions* of the Illinois State Medical Society[1]: "This So-

1. Transactions of the Illinois State Medical Society, Transaction 45, p. 54.

ciety shall be auxiliary to the Illinois State Medical Society and the American Medical Association, and shall conform to the code adopted by the latter."

Improved means of travel resulting from the construction of three railroads, the Alton and Terre Haute (now the Big Four), the Ohio and Mississippi (Baltimore and Ohio) and the Illinois Central, had much to do in bringing about the prosperity that the Aesculapian Society enjoyed throughout the greater part of the decade of the 50's.

Dark days followed. During the Civil War but two meetings were held, and as an aftermath "irregular" practitioners abounded. Member after member was expelled for quackery; special meetings were even called devoted wholly to the discussion of ethics. Early in the 70's the Society again entered upon a "career of prosperity and honor."

The Aesculapian Society furnished four presidents to the Illinois State Medical Society before the end of the century, Doctors William Chambers, 1860, James Steele, 1865, G. W. Albin, 1871, and J. D. Washburn, 1876. It was twice represented on the State Board of Health, first by Dr. Chambers in 1877, and twenty years later by Dr. Charles B. Johnson.

The progressive spirit of the early Society is shown by the fact that in 1856 it appointed a committee to go before the Legislature and recommended the creation of a State Board of Health for the regulation of the practice of medicine and the registration of births and deaths. In 1861 it appointed a second committee. Both efforts were fruitless. In 1876, when a committee of five was appointed for the same purpose by the Illinois State Medical Society, two members were from the Aesculapian Society.

The third society of import was the Peoria District Medical Society, founded in that city on April 19, 1848, embracing Peoria, Fulton, Stark, Tazewell, Woodford and other counties. It supplied a number of the names appearing on the membership roll of the Illinois State Medical Society, among them Doctors Rudolphus Rouse, Francis A. McNeill, Elias S. Cooper and Robert Boal. A. G. Henry, who had formerly resided in Peoria, had also contributed to the work of this society.

The fourth and last society occupies a peculiar position in regard to the State Convention of 1850. It was instrumental in starting the Illinois State Medical Society on its path, but supplied not one member to the Convention. This was the Ottawa Medico-Chirurgical Society, organized on January 1, 1849, whose president was Dr. Allen Howland. It was the successor to a short-lived group calling itself the Medical Society of La Salle and Adjoining Counties, instituted in 1847.

One of the first projects undertaken by the new society was the launching of a convention to be held in Springfield on the first day of January, 1850. The September, 1849 issue of the *Northwestern Medical and Surgical Journal* carried an editorial comment apologizing for its failure to call attention to the circular announcing the convention and added: "We are happy to express our approval of, and cooperation in this project; but we doubt the propriety of the time appointed. The close of navigation at that time will have the effect of procuring but a meagre attendance. ..... As the matter has been so long deferred, we would suggest that the convention be postponed until May, at which time we suppose a tolerably full attendance might be procured."[2]

The immediate results of the early notice were to distinctly discredit the efforts of the Ottawa Society. This notice had been sent not only to prominent doctors and to medical societies and publications, but to the secular press as well. The notification proved to be a veritable explosive. It is reported to have been the means of exciting ridicule at the hands of the newspapers, whose caustic criticisms resulted in the appointment of a committee to prepare resolutions disavowing the officiousness of the secretary. The report of the committee was a severe rebuke to the author, whose wordy effort they characterized as "bombastic literary nonsense."

In spite of the Secretary's wounded pride and the creation of much local ill-feeling, the Society received a number of encouraging replies expressing the necessity for a State Society. As a consequence a new call was drawn up for a convention to be held in Springfield on June 4, 1850 and duly sent to the *Northwestern Medical and Surgical Journal* for publication. When the Convention finally convened, it represented

2. Northwestern Medical and Surgical Journal 6:295.

the realized hopes of the early physicians of Illinois.

March of 1850 saw the birth of the Chicago Medical Society, which met on April 5 and elected Dr. Levi Boone president. The same year saw the birth of the Fox River Valley Society.

Certainly the struggle for a permanent medical society in Illinois, which should have statewide representation, placed the names of Dr. John Todd and Dr. Levi Boone beside those of such men as Daniel Brainard and N. S. Davis in zeal for the welfare of their profession.

ILLINOIS STATE MEDICAL SOCIETY COMMITTEE ON MEDICAL BENEVOLENCE

The House of Delegates of the Illinois State Medical Society at its Annual Meeting held May 21-22-23, 1940, voted that certain changes be made in the Constitution and By-Laws to enable the Society to establish a Benevolent Fund for indigent physicians and their widows.

The plan adopted very closely resembles the one which has been operating in Pennsylvania for the past thirty-seven years.

We are publishing herewith the personnel of the Committee together with an outline of the purposes and the power given the Committee to carry on this work.

Committee on Medical Benevolence, John S. Nagel, Chairman 185 N. Wabash, Chicago, Ill. Charles H. Hulick, Shelbyville; Clarence H. Boswell, Rockford.

PURPOSES OF THE COMMITTEE

1. To create a Benevolence Fund:
   a. Through allocation of $1.00 each year from dues of each member.
   b. Through gratuities, endowments, etc.
   c. Through the efforts of the Women's Auxiliary to the Illinois State Medical Society.

2. To investigate cases of alleged financial difficulties on the part of members, their widows or widowers.

3. When found worthy, to appropriate regular monthly benefits not to exceed $25.00 to $30.00 per month in any one case. When deemed advisable, may appropriate more over a short period of time when rehabilitation seems probable.

4. To designate the component society secretary in each county as the county chairman to submit applications from members for benefits, then to see that a questionnaire form is properly executed to give the desired information relative to the case. The Councilor of the District may assist the Committee in submitting names of members, their widows or widowers, when he believes the individual is entitled to the benefits herein prescribed.

5. When it is the opinion of the Committee that the case is a worthy one and benefits should be allowed, the Chairman of the Committee should notify the Secretary of the State Medical Society, stating the amount agreed upon as the regular allowance, stating the intervals at which the benefits shall be paid, so that proper vouchers may be submitted.

THE INVESTIGATIONS

When it is reported to the Committee that a member, widow or widower of a member is needy and unable to secure the necessities of life, a questionnaire form shall be submitted from the Secretary's office asking for the following information:

1. A brief social history of the applicant, past and present. Data concerning reasons for being in want whenever possible, and all other pertinent information which will enable the Committee to take the proper action.

2. A brief financial history including present assets and income, sources and amount.

3. Disbursing of present resources (rent, food, clothing, etc.).

4. Statements as to probable permanency of the present distress.

5. Any possible sources of assistance such as:
   a. Relatives .....
   b. Friends .....
   c. Fraternal Organizations .....
   d. Insurance .....
   e. Pensions .....

6. Have all sources of help been solicited?

7. Additional information. Means by which influence might be exerted to find employment or some other source of income. Is there a possibility of rehabilitation? (With moderate financial assistance over a short period of time, would it be possible for the applicant to become self-supporting?)

PROCEDURE

Requests from members, their widows or widowers for assistance, if submitted to the Secretary, shall be referred to the Committee promptly. At the same time a questionnaire form will be submitted to the applicant or to the county society secretary, or to the Councilor if the information is submitted by him. All possible information which will aid the Committee in determining the eligibility for assistance, the amount actually needed, or if rehabilitation through short time payments is probable, should be submitted promptly.

Each case will receive the proper consideration by the entire committee which shall pass final judgment on:

1. Eligibility for aid.
2. The amount of aid.
3. Whether for a short time or permanently.

The decision of the Committee shall be final and there will be no higher authority within the Society to whom appeals from decisions of the Committee can be referred.

In the event that additional income is received and the individual is no longer eligible for further benefits, the county society secretary or the Councilor submitted the data, should notify the Committee of these facts promptly.

As soon as a reasonable amount is accumulated in the Benevolence Fund, only the income from the Fund shall be used to pay benefits.

The Medical Benevolence Fund shall be subject to an annual audit as are other funds of the Illinois State Medical Society, although merely the amount of the Fund, the payments made during the year, the additions to the Fund, and the interest from investments shall be mentioned. The names of beneficiaries shall not appear in the annual audit, nor shall they be mentioned in the annual report of the Committee to the House of Delegates.

The Secretary of the State Medical Society shall maintain a separate file for all correspondence relative to beneficiaries, amounts paid, investigations and minutes of meetings of the Committee, which shall be a closed file and not open to inspection by others than members of the Committee, the Auditor, or a regularly designated Committee of the House of Delegates.

As the regular vouchers of the Illinois State Medical Society are paid through the State Bank and Trust Company of Evanston, all funds for benevolence purposes shall be maintained in another bank and payments for benevolence purposes shall constitute the only vouchers drawn on these funds. The council of the Illinois State Medical Society has allocated the sum of $5,000.00 maintained in the National Bank of Monmouth for several years as a Certificate of Deposit, as the nucleus for the Benevolence Fund, and payments shall be made from this fund on this bank.

NOTE: The above report and procedure was presented to the Council of the Illinois State Medical Society in regular session on August 4, 1940, by the Chairman of the Committee on Medical Benevolence. The report and procedure were approved, and the Committee instructed to make the necessary arrangements to function immediately. The Council was authorized by the House of Delegates at the 1940 annual meeting to approve a method of procedure so that the work could be started with a minimum amount of delay.

WOMAN'S AUXILIARY
THE BENEVOLENT FUND

The House of Delegates of the Illinois State Medical Society at its Annual Meeting held May 23, 1940, voted that certain changes be made in the Constitution and By-Laws to enable the Society to establish a Benevolent Fund for indigent physicians and their widows.

The Illinois State Medical Society has requested the Auxiliary to assist in this great work.

It is not necessary to remind the Auxiliary members the advantages accruing from such a plan.

As President of the Auxiliary, I welcome the opportunity to make this crusade for benevolence a major objective. I trust that it will prove a stimulus for increased membership in the Auxiliary.

At present there are in the State of Illinois 1000 Auxiliary members in 22 organized counties. This represents only 20% of the doctors in the Medical Society. It is my earnest hope that the physicians will cooperate with the Auxiliary to the end, that more Auxiliaries may be organized and a larger membership assured.

Illinois is following the Pennsylvania plan,

where last year over $4000.00 was raised for this fund.

To date 8 counties have pledged aid to the Benevolent Fund. Card parties, bake sales, teas, dances, assessment of $1.00 from each member, are some of the means used by the Auxiliaries to raise money.

As physicians' wives we will wholeheartedly support this project, realizing that in the final analysis it is the physician's wife who will benefit from this benevolence.

In conclusion, Auxiliary members, I appeal to you to accept the challenge of the Illinois State Medical Society. They solicit our assistance. Do not let us fail them.

Mrs. Harry Dooley, President

To the Woman's Auxiliary to the Chicago Medical Society. Does it mean anything to you that the first and second recipient of aid from our Benevolence Fund were doctor's widows?

Dr. J. S. Nagel, Chairman.

CANCER IS SECOND IN THE LIST OF CAUSES OF DEATH

An article, "What You Should Know About Cancer," appeared in *The Health Officer,* September, 1939. The medical profession in their campaign of education should pass the information to the lay public. We abstract and quote as follows:

"Twenty-five years ago it stood seventh in the list of causes of death," says the article. "Now it is second, claiming over 140,000 lives annually—more than twice as many deaths as are attributed each year to tuberculosis. Only heart disease kills more people."

Principally a disease of adult life, it occurs most often between the ages of forty and seventy. Although it may affect any part of the body, it occurs more frequently in the female breast and genital organs; thus women are afflicted by cancer more often than men.

"Many absurd ideas regarding the relationship of diet to cancer are prevalent," the article advises. "Neither a high protein diet, a vegetarian diet, the ingestion of alcohol, nor over-indulgence in any type of food have any demonstrable effect upon the incidence of cancer. On the other hand, clinical evidence suggests that poor teeth, or lack of teeth, the ingestion of hot food and drink, irregularity of meals, and gastro-intestinal diseases may be of some importance in the causation of stomach cancer."

Particular food substances, methods of food preparation and the use of certain cooking utensils—aluminum ware, for example—have no known influence upon the causation, prevention, or cure of the disease.

Cancer is not contagious, nor is the influence of heredity determined; but its exciting causes are known to be many. Chemical irritations, for example, exposure to heat, light, X-rays, or radium over prolonged periods of time, may start the abnormal growth of cells known as a cancer.

"Despite many claims," warns the article, "no reliable skin or blood test has been developed for the diagnosis of cancer. Much experimental work is being done, however, and it is hoped that a dependable test will in time be worked out. Physicians now depend for a diagnosis upon the microscopic examination, by a competent pathologist, of a small piece of the suspected new growth."

Under the heading "Danger Signals," the article lists certain symptoms which point to the possibility of cancer and these should lead immediately to a visit to a physician. These "signals" are:

1. Any persistent lump or thickening, especially of the breast.
2. Any irregular bleeding or discharge from any of the body openings.
3. Any sore that does not heal, particularly about the tongue, mouth, or lips.
4. Persistent indigestion, especially when accompanied by distaste for meat.
5. Sudden changes in the form or rate of growth of a mole or wart.
6. Pain is usually a late symptom—do not wait for it.

There are over 5,000 quack "cures" for cancer on record, according to the article, which further warns against the "sure fire" treatments advertised to cure all types of cancer by methods which are kept secret. The modern treatment of cancer employs surgery, X-rays, or radium, or a combination of these methods. No other instrumentalities are recommended.

Fear and ignorance of the nature of cancer prevent many persons from securing early treatment. It has been estimated that 25,000 deaths from cancer could be prevented each year if people were fully informed and took advantage of existing knowledge of the disease.

"So far as possible one should avoid prolonged irritation to any part. Protection from over-exposure to the sun and wind, prompt repair of all birth injuries to the womb, permitting the breast to function normally, repair of jagged teeth, avoidance of ill-fitting dental plates, self-control in using tobacco, correction of chronic constipation—in short, elimination of unnecessary abuse of any tissue is a common sense method of helping to guard against cancer.

The Smiths were on the balcony and can hear what a young couple are saying in the garden below.

Mrs. Smith: "I think he wants to propose. We ought not to listen. Whistle to him."

Mr. Smith: "Why should I? Nobody whistled to warn me."

Were all men built to a stock pattern so that they responded to physical agents or bacterial infections in regular fashion according to their peculiar constitution, the practice of medicine would be a simple business. . . All men, however, are like contrary women of whom the comedian sang: "You never see two alike any one time and you never see one alike twice."—*M. J. Australia.*

MEDICAL ECONOMICS

H. M. Camp, M. D.
E. P. Coleman, M. D.
J. H. Hutton, M. D.
Ralph Peairs, M. D.
R. K. Packard, M. D.

Edited by the Committee on Medical Economics
of the
Illinois State Medical Society
E. S. Hamilton, M. D., Chairman
Kankakee, Illinois
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The end of a calendar year and the beginning of a new one is a good occasion to have a critical look at the accomplishments of the past year and try to prepare for what the coming year will produce. During 1940, the medical profession made a most creditable showing. They continued their program of educating the public of the danger inherent in State Medicine and at the same time opposed any definite action in Congress on that subject. Of course, the importance of world-wide problems helped to keep the reformers occupied in other more important fields, but at least we have the satisfaction of knowing that no progress was made in the socialization of the practice of medicine. However, the impending trial, of the officers of the American Medical Association for violation of the Anti-trust act is still on the calendar of unfinished business, and hovers over the peace of mind of the medical profession. It is to be hoped that a definite decision will be arrived at during the coming year. The medical profession has offered and delivered when requested all possible assistance in the Defense Program. At all times since the annual meeting in New York, when the request for cooperation was made and the promise that it would be given was made by the House of Delegates, the organized medical profession of the nation has done everything requested and we feel that this spirit of cooperation will continue in the conscription of men as well as in their care after they are inducted into the armed forces of the nation, even though it means a large number of physicians will be obliged to leave their private practice for less remunerative positions in either the Army or Navy. The younger men in the profession, as well as some of the older men have evidenced their willingness to cooperate by enlistment in the Reserves Officers Corps.

We must not feel that all dangers of legislation affecting the medical profession is past. In the December 7, 1940 issue of *Congressional Intelligence*, Washington's Oldest Factual Service, the statement was made that the Health Program would again come before Congress in 1941, based probably on the large number of rejections for Army Service. This will be offered as concrete proof that the health of the nation is bad, in spite of the statistical proof that we are the healthiest nation in the world today and are definitely in better health than we were ten years ago. Under the label of aiding in defense, any such program would be almost certain of Congressional approval. Such a statement from so good a source should make us resolve to continue the campaign of opposition to any socialization of the practice of medicine. The *Victor News* for December 1940, contains an article in regard to Rural Health in which Dr. R. C. Williams, chief medical officer for the Farm Security Administration, is quoted as saying "The health of our rural population is inseparable from the health of our defense forces. Rural areas regularly contribute more recruits in proportion to their population than cities and large towns. Although Americans are supposedly healthier than ever, Army Medical officers are finding nearly one out of every three volunteers unfit for military service because of physical defects or impaired health." So you can see that already the propaganda mill is in operation even before the examination of conscripts is really begun. Of course, we can expect more of the same.

The success or failure of Group Hospitalization is now being analyzed. There can be no doubt that it takes care of one of the largest costs of illness, particularly the catastropic kinds, which strike suddenly. Whether or not it is actually sound is still controversial. Some of the groups operating the plans have been obliged to raise the annual cost and few of them have been tested by an epidemic or a catastrophe, which makes an abnormally great demand for hospital care. Until that time arrives the an-

swer must be held in obeyance. Another danger, long suspected, is coming into the open and that is the selling of medical service along with hospitalization by the hospital. This may well become a serious question and one that may lead to great difference of opinion and even trouble within the medical profession. As practicing physicians and members of the staff of hospitals we must consider this problem before the real attempt is made to include it in any such plan. We must be ready to tell the hospitals in which we work just how we feel on the matter and must give good and sufficient reason for our stand.

The sickness insurance plan of Greendale, Wisconsin, has been abandoned, according to recent information, because it had proved a financial failure. Physicians have received less than one half of their fees, and administrative costs have not been covered. The number of subscribers had dropped to 155, and although 450 doctors were cooperating, and at the cost $24.00 per year there was no demand for such service. Incidentally it might be mentioned that the State Medical Society of Wisconsin has severed all connections with the local Associated Hospital Service, because they have been including medical service in group hospitalization contracts. It is quite apparent from the above that there is still much testing to be done before the solution of some of the problems of delivering so-called adequate medical care can be arrived at. Certainly much more time and study are necessary than has been given up to this time. And this study should be given by that group of men, best able to evaluate all the factors entering into the delivery of that service to those in need of it, the medical profession.

The President of the Illinois State Medical Society, has prepared an article on Medical Service to the Rural Population, and has kindly presented it to this Committee for publication. Every member of the Illinois State Medical Society should read any article by its president, and particularly when written on a subject with which he is so conversant. Also it affects at least one half of the physicians of the state.

The National Conference on Medical Service, formerly the Northwest Regional Conference, will be held Sunday Feb. 16, 1941 at the Palmer House. Every physician interested in the economic problems of medicine should attend.

The Committee on Medical Economics wishes every reader of this column, A HAPPY NEW YEAR.

E. S. Hamilton, Chairman

MEDICAL SERVICE TO THE RURAL POPULATION

Modern Medicine comes from Greek medicine. The Greeks assimilated all that previous civilizations had to offer and took the best from existing civilizations.

As medicine of the early Greeks became organized it was in the hands of the priests of Aesculapius whose temples of healing were located about the countryside. So great as the Greeks believed was the power of Aesculapius over disease, so wonderful were the cures which he accomplished, and so noble and fine his character that they not only made him a god, but erected temples in his honor. These temples were not places of barren worship, but were sanatoria prototypes of our hospitals and schools of medicine.

The means chiefly employed for the restoration of health were sunlight, fresh air, pure water, exercise and diet. Instructions in medicine was oral, since there were no written medical books.

With the lapse of time the religious features of the temple fell away to give place to more and more radical medical treatment. The greatest of these early physicians was Hippocrates who was born on the Island of Kos in 460 Before Christ.

For nobleness of professional character he has been the model of countless generations of physicians. A quotation from the oath he required young men to take before entering practice is as follows: "Into whatsoever house I shall enter I will go for the benefit of the sick, holding aloof from all voluntary wrong and corruption, including the seduction of males and females of freeman and slaves. Whatsoever in my practice or not in my practice I shall see or hear amid the lives of men I will not divulge, as reckoning that all such things should be kept secret."

Greek medicine survived for three hundred years but after the fall of Corinth, Greek medicine was carried to Rome. In time the Roman empire fell and its medical knowledge and practice was carried away by the Barbarians.

Until this time the world had been largely rural. Flocks and herds had been the chief dependence of populated districts for food. As cities formed the populace became filthy and were attacked by epidemics, so called scourges. Even doctors had little ideas of cleanliness or sanitation. Disease became so common that whole cities were devastated. For several hundred years the population found it difficult to hold its own against the savages of disease and but for the rural inhabitance whole nations would have been swept away by sickness.

In the seventeenth Century, some advancement was made in medicine. The writings of Hippocrates were first translated. Harvey discovered the circulation of the blood. In the eighteenth century, Jenner, in a rural home, discovered vaccination for the prevention of smallpox, a boon to those who live in rural districts as well as those in the cities. Dr. Jenner did not live to realize the greatness of his discovery. That from this idea of vaccination would be developed a system of vaccination to save countless millions of lives. Diphtheria vaccine has conquered Diphtheria and typhoid vaccine, typhoid, until recently two of the most common causes of death. Smallpox is seldom heard of and when it does occur is in a very mild form because of vaccination of generation after generation. In the sixteenth century the Spaniards brought this disease from Europe to Mexico and American Indians became infested. It caused the death of half of them in the next four years. Even the Colonists, though at that time practically all ruralists, suffered terribly from the disease until vaccination became of universal use.

In 1846, anesthesia was discovered and, though there has been much objection to its use, it has become one of the most useful to mankind of all discoveries. Our rural populations have as much benefit from its use as any other group of citizens. In 1847, Semmelweis demonstrated the contagious nature of puerperal fever. In 1867, Lister discovered that antiseptics could be useful in obstetrics and surgery, revolutionizing surgery and saving countless lives of mothers in childbirth.

Our rural population has the same advantage derived from these as their city cousins. Pasteur, a French chemist, further developed the work of Jenner, Semmelweis and Lister and revolutionized all of medicine. No class of citizens of these United States are denied the benefits of the discoveries of these great men whose names will never fade or be stricken from the pages of Medical History.

Let us consider the benefits of these great discoveries of principles now in use for the health and happiness of humanity in our America.

The effect is more pronounced in the saving of the lives of children. It is true the span of life has been doubled but comparatively little has been done to stay disease of the aged. The older are made more comfortable and have not been forgotten.

Only in the last half century have we learned to utilize and appreciate the discoveries of Jenner, Semmelweis, Lister and Pastuer and a few figures will show that organized medicine has developed ways and methods to save humanity from some of the results and death from horrible diseases that previously baffled the minds of our most capable and worthy physicians.

Please note carefully that in 1913, just a little more than a quarter of a century ago, scarlet fever, diptheria, measles, whooping cough, and typhoid fever in one years time in the State of Illinois caused the death of 4,148 persons, we might say children but a few were adults.

Twenty-six years later, during the year 1939, the same diseases were the cause of but 451 deaths as taken from the records of our state. We are accused of neglecting our citizens unable to pay. Does it seem true with these facts before us?

We are also accused of not giving the ruralist proper medical care. What are the facts? From the *Illinois Health Messenger,* August 1938, last year in Illinois there were 33,953 births in communities of less than ten thousand people and in the strictly rural areas. Among these, most of whom were not born in hospitals, the loss of life was at the rate of 46.8 per 1,000 births. In the cities of ten thousand or more, exclusive of Chicago there were 31,697 births and the rate of loss was 46.6 per one thousand, only a slight difference and the urban babies were mostly born in hospitals while the rural babies were born in the home. On the other hand, mothers fared best in the rural areas. Deaths of mothers from puerperal causes in rural districts were at the rate of 2.7 per thousand live births against 4.2

in all municipalities. Statistics show that improvement in infant and maternal mortality had been much more rapid in recent years in the rural than in urban localities. The facts just stated prove beyond question that rural communities are not neglected and if any appreciable number of our citizens of any class were not receiving proper medical care the improvement of health conditions employed by our people could not be attained. The medical profession hopes to do better, not only this annual meeting where by far the majority of us care for the sick in rural communities but the Illinois State Medical Society last year held four Post Graduate Meetings in different parts of the state outside of Chicago that were attended by over six hundred. This year we have already held four and expect to have six more, one of which will be held at Carbondale for Southern Illinois doctors.

Lectures in these meetings are given largely by men from our best Universities and a real Post Graduate course given for you who practice among the country folks and cannot leave your post for a longer course.

Within the memory of many of us we had the opportunity of attending but two medical meetings a year, we did well to attend the Southern Illinois meeting and it was a great treat to get a day off to attend the Illinois State meeting. If a man wanted to attend a real Post Graduate course, he was supposed to go to Vienna or Edinburg. Something but few did. Doctor, we are bringing better Post Graduate work to your very door. Our County meetings, our Southern Illinois meetings, and the Post Graduate work furnished by the State Society are all excellent. Citizens of all brackets, rich, poor, middle class, urban or rural, are all benefitted by the advances of medicine. They are and will be favored to the same degree you educate yourselves. Let us not fail any of them under our care.

Correspondence

THE OLD-FASHIONED DOCTOR

Chicago, Ill.
December 6, 1940

To the Editor:

To the generations that are past the doctor was a man apart. When he passed, the children gazed with awe, respect and a tinge of fear. He knew many things not known to other men, things of which he never spoke. He drove the lonely roads at night when his soul new glories learned.

At the great event, the advent into life, he was there to give safe conduct to the crying, helpless, little babe. And when the eternal journey was begun he was there; his presence soothed the grief of those who in spirit waved farewell. When we were ill, he calmed our fears with manner and with words and eased our pains with magic drugs.

Men told him things they dared not tell their wives. Women, confessions made, that would have set the town aflame. The prescriptions were wise counsel and sound advice, for which he nothing charged. He knew not Freud or James, but he read the minds of men.

The doctor never seemed concerned about God or the hereafter. He was not afraid; in the midst of danger he was calm. He believed that the God who rules the universe must have contempt for fear.

Emmet Keating, M.D.

VACANCIES ON MEDICAL STAFFS OF STATE HOSPITALS

Springfield, Ill., Dec. 2, 1940

To the Editor:

At the present time, there are many vacancies on the medical staffs of the State Hospitals for the insane and feebleminded under the jurisdiction of the State Department of Public Welfare.

Physicians enter the service in the classification of junior physician. Legal residence in the State of Illinois, citizenship in the United States, graduation from a Class A medical college, as defined by the American Medical Association, a maximum age less than 45 years and license to practice medicine in this State are required.

The salary for this position is $150 per month with full maintenance for self and family. At the end of each year of service, an automatic increase of $5.00 per month is allowed, until the maximum of $180 per month is attained. The quarters for physicians and their families have been improved considerably by the construction of new staff houses at many of the hospitals.

If no civil service examination is pending, the

applicant may be appointed and will be required to take the next examination for the position of junior physician which is scheduled by the State Civil Service Commission, thus affording merit protection.

Advancement to the higher classification of senior physician, clinical director and assistant managing officer is provided through promotional examination.

Opportunities for graduate training in psychiatry while employed in the State service have been provided and will be augmented when the additional wards and research facilities in the new Psychiatric Institute are made available in the near future.

In addition to the above staff positions, two classes of training positions are also available: Internships in psychiatry for a period of six months are available at a stipend of $26.25 per month with maintenance for self only. Such an internship may be served by physicians who have completed their fourth year of medical school but have not yet served a regular internship. Residencies in psychiatry are available for varying periods of service at $52.50 per month with maintenance for self only. Applicants for the position of junior physician who have had no special training in psychiatry may be required to serve for a three months training period at the resident's salary. Physicians wishing to specialize in psychiatry to the extent of preparing for the examinations of the American Board of Psychiatry and Neurology, may prefer to serve a years residency in one of our State hospitals approved by the American Medical Association for this purpose.

Applicants should communicate with Mr. Charles E. Day, Director, State Department of Public Welfare, Springfield, Illinois, for further information.

WHERE TO FIND TRANSACTIONS OF THE ILLINOIS STATE MEDICAL SOCIETY

Northwestern University Medical School Library
Transactions 6-14 (1856-1863)
Transactions 21-48 (1871-1898)
John Crerar Library
Transactions 1-14 (1851-1863)
Transactions 17-48 (1866-1898)
Rush Medical College
Transactions 6-48 (1856-1898)
University of Illinois Medical School Library
Transactions 22-48 (1872-1898)
Loyola U. School of Medicine Library
Transaction 34 (1884)

*No meetings were held in 1862 and 1863. Therefore there are no Transactions numbered 12 and 13.

HISTORICAL DATA WANTED

To the Editor:

To Component County Societies of the Illinois State Medical Society: Those of you who attended the Peoria session of the Society will recall the very fine photographic exhibit arranged by Dr. Carl E. Black to set forth as fully as possible the history of the Illinois State Medical Society. A Committee on Archives is very anxious to add to this material. Further it is asking that each county society appoint a similar committee and that it secure from each of its members as much historical data as possible. This includes photographs, material from family scrap books, newspaper clippings and other material pertaining to physicians in Illinois or of those physicians who were once living in Illinois.

If you do not know what to do with your old minute books, please get them into the hands of the Committee on Archives.

Arrangements are being made to store all this material with Dr. H. M. Camp, Secretary of the Illinois State Medical Society. Your contribution should be sent to the undersigned or to Dr. Camp.

Dr. Carl E. Black, Jacksonville;
Dr. P. J. McDermott, Kewanee;
Dr. D. D. Monroe, Alton, Chairman.

PLEASE IDENTIFY PHOTOGRAPHS

Jacksonville, Illinois.
July 28, 1940.

To The Editor:

Many photographs of Illinois physicians were handed in at the annual meeting of the Illinois State Medical Society in May and others have been sent to me here. In a number of cases there was insufficient data to show who sent them.

I am publishing this notice in the ILLINOIS MEDICAL JOURNAL notifying those who have not received due acknowledgement to write me and I will be glad to express appreciation.

There is one set of six or eight excellent photo-

graphs that I do not know who handed them in. I would like to show these people proper appreciation. Publishing this item in the ILLINOIS MEDICAL JOURNAL will at least show the right spirit.

Carl E. Black, M. D.

PICTURES OF THE PAST PRESIDENTS AND SECRETARY WANTED

Officers of the Illinois State Medical Society are extremely anxious to complete the file of pictures of all past presidents. There are a number missing and it is hoped that someone may be able to furnish copies to the Editor of the JOURNAL, Charles J. Whalen, M. D., 25 East Washington Street, Chicago.

President's Name	Year
Samuel Thompson	1851
C. N. Andrews	1854
A. H. Luce	1864
J. M. Steele	1865
S. W. Noble	1867
G. W. Albin	1871
Secretary's Name	**Year**
H. Shoemaker	1851

EXTRA COPIES AVAILABLE OF THE CENTENNIAL NUMBER OF THE JOURNAL

We have on hand a goodly number of the Centennial issue. (May, 1940) of the ILLINOIS MEDICAL JOURNAL. This particular number records the progress of medicine in Illinois during the past hundred years. It is really a granary of medical historical data. Postage, 10 cents. 6221 Kenmore Avenue, Chicago, Illinois.

MOUNTING FEDERAL TAXES

According to the Federal Tax Bulletin the NEW 1940 tax law drastically changes the entire structure of personal taxation. The BROADENED tax-base, and the sharply UPPED surtax rates, make tax costs in all income brackets TREMENDOUSLY HIGHER — in some cases showing an increase over 1939 taxes of 285%.

The following comparison between the 1939 law and the NEW law shows how tremendous these INCREASES are for a married person:

Net income	1939 tax	NEW tax plus SUPER-tax	% increase
$3,000	$8	$30.80	285%
4,000	44	70.40	60
15,000	924	1,258.40	36
40,000	5979	9,552.40	60

Therefore, the new tax law — with higher income tax rates and new SUPER-tax — increases the tax payment 30 to 285 per cent.

EDUCATIONAL COMMITTEE

November and December, 1940

December 1940 brings to completion five post-graduate conferences in five different councilor districts of the state. The conferences in Mattoon and Alton were held in November and December.

The attendance at the meetings numbered 672, representing many different counties and communities.

A meeting of the Post-Graduate, Scientific Service and Educational Committees was called for early December at which time plans were made for carrying on post-graduate programs in a somewhat different form during the coming months.

Copies of all papers presented at the conferences were sent to doctors attending.

SCIENTIFIC SERVICE COMMITTEE

104 — Speakers presented scientific papers before medical groups. Special programs were arranged for the Tri County Medical Society, the Southern Medical Association, the North Central Medical Society and weekly meetings of the Will-Grundy County Medical Society.

The Educational Committee assisted county society secretaries in not only arranging the programs, but also in giving publicity to the newspapers and in notifying physicians.

The following information shows the counties receiving assistance:

Notices to doctors —

98 — Effingham County Medical Society meeting
214 — Whiteside " " " "
99 — Bureau " " " "
278 — Perry " " " "
246 — Fulton " " " "
133 — Knox " " " "
167 — Henry " " " "
85 — Jefferson-Hamilton " " "
64 — DeKalb County " " "
60 — Randolph " " " "

Newspaper publicity for medical meetings —

56 — Releases for LaSalle County
48 — Releases for Bureau County
30 — Releases for Effingham County
55 — Releases for Whiteside County
103 — Releases for Fulton County
27 — Releases for Knox County
43 — Releases for Henry County
57 — Releases for DeKalb County
130 — Releases for Southern Illinois Medical Association
234 — Releases for Post-Graduate Conference
4 — Releases for North Shore Branch
50 — Releases for Chicago Medical Society public meeting

SPEAKERS' BUREAU

69 — Doctors presented popular health talks to lay organizations. Through the courtesy of the Chi-

cago Board of Education and the kindness of Dr. F. L. Rector of the American Society for the Control of Cancer, it was possible to have talks on CANCER given in the following Chicago schools —

Sullivan High School	—	300 present
Lane Technical School	—	1500 present
Austin High School	—	500 present
Manley High School	—	1550 present
Crane Technical School	—	1000 present
Steinmetz High School	—	460 present
Flower Technical School	—	2400 present
Taft High School	—	1500 present
Marshall School	—	550 present
Senn High School	—	3000 present
		12,760

RADIO

12 — Radio talks were given over stations WJJD and WAAF in Chicago.

Copies of radio talks were sent to several downstate county societies for local use.

PACKAGE LIBRARIES

Calls for loan of the package libraries steadily increase.

The office of the committee is always glad to compile special material which may be requested by any doctor in the state.

One doctor using package library on a special subject wrote as follows —

"I returned that splendid list of papers by messenger and take this opportunity to thank you for your favor and trouble in the matter. The selection was exactly what I wanted and helped me considerably in making which I hope will prove a worth while paper, for the Drug and Chemical Section of the Credit Men's Association.

"You must have a wonderful organization and clipping bureau to be able to meet all comers in so splendid a way."

NEWSPAPER SERVICE

Articles written and approved on the following topics —

Your Most Dangerous Years	Appendicitis a Menace
Thanksgiving 1940	A Happy Recovery
Benjamin Franklin, The Benefactor	Smallpox Still a Menace
Measles Threatens	Winter Asthma
Your Health in 1941	Christmas Time Hazards
	Sniffles — 1941

1,040 — Editorial Style health articles to newspapers
842 — Health columns to downstate newspapers
116 — Health columns to Chicago newspapers
16,852 — Articles to lay leaders throughout the state

MISCELLANEOUS

Special publicity was given to the first lay meeting sponsored by the Chicago Medical Society. 35 letters were sent to prominent leaders. 500 mimeographed and 500 printed notices were sent to libraries, health chairmen, etc., anouncing the meeting.

94 — letters were mimeographed for a Councilor.

Respectfully submitted
Jean McArthur

THREE QUARTERS OF A CENTURY FOR PARKE, DAVIS & COMPANY

The year 1941 marks the Diamond Anniversary of the founding of Parke, Davis & Company, a firm which had its inception in a small drug store in the City of Detroit, Michigan, and which, during the past seventy-five years, has become the world's largest makers of pharmaceutical and biological products.

From the very beginning, back in 1866, Parke, Davis & Company had engaged in research work with the object of making available to pharmacists and physicians, medicinal preparations of the highest degree of accuracy.

In the early 70's pharmaceutical progress meant the discovery of new vegetable drugs. Energetic — and extensive — explorations gave to the medical profession such valuable and widely used drugs as Cascara and Coca. Then, in 1879, came one of Parke-Davis's greatest contributions to pharmacy and medicine — the introduction of the first chemically standardized extract known to pharmacy. Desiccated Thyroid Gland, the first endocrine product supplied by the Company, was introduced in 1893. One year later, Parke-Davis established the first commercial biological laboratory in the United States. In 1897 came the introduction of the first physiologically assayed and standardized extracts. And throughout these early years, the fundamental Parke-Davis policy — precision in pharmaceutical manufacture — was crystallizing.

In addition to its Detroit headquarters, branches and depots are maintained in important cities throughout the country, the list including Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Dallas, Denver, Indianapolis, Kansas City, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, San Francisco, St. Louis, and Seattle.

In the foreign field, to care for the Parke-Davis business which extends to every quarter of the globe, branches are located in London, England; Sydney, N.S.W.; Walkerville, Ontario; Montreal, Quebec; Toronto, Ontario; Winnipeg, Manitoba; Bombay, India; Havana, Cuba; Buenos Aires, Argentina; Rio de Janeiro, Brazil; and Mexico City, Mexico.

BEWARE OF TULAREMIA

Rabbit Fever is on the increase. A recent report of the Public Health Service shows that from 1930-1939, there were 1927 cases of Tularemia or rabbit fever in Illinois. The State of Ohio followed second with 900 cases and Missouri third with 827.

Tularemia is an acute infectious disease caused by Bacterium tularense and occurs under natural conditions in over 20 kinds of wildlife, especially in wild rabbits and hares. Man becomes infected by contact of his bare hands with the raw flesh and blood of these animals or by bites of blood-sucking ticks and flies which have previously fed on animals infected with Bacterium tularense.

Tularemia symptoms include fever, chills, sweating,

headache, vomiting, malaise and prostration. In the great majority of cases, a sore or ulcer marks the place of entrance of the infection. Because tularemia easily develops into a form of pneumonia, it is a very dangerous disease.

Anyone handling rabbits should wear rubber gloves. Freezing the meat does not kill the tularemia germs, but cooking does. One can therefore see the importance of cooking rabbit until it is thoroughly done.

SOCIETY OF ILLINOIS BACTERIOLOGISTS PROGRAM

Jan. 31, 1941

Experiences with Microbiological Assay of Riboflavin (Vitamin G). H. W. Cromwell, Abbott Laboratories

Some Recent Studies in Anaphlaxis. Dr. Carl A. Dragstedt, Northwestern University

The Bacteriology of Brick Cheese, Dr. J. C. Garey, University of Illinois (Urbana)

Laboratory Aids in Diagnosis and Treatment of Pneumonia. Dr. Wayne W. Fox, Northwestern University and Evanston Hospital

MEMBERSHIP AND FELLOWSHIP

Every Member in good standing in the constituent state medical association where he is engaged in practice, whose name is officially reported to the Secretary of the American Medical Association for enrollment, becomes automatically a Member of the American Medical Association and is not called on, as such, to pay any dues or to contribute financially to the Association.

Members of the American Medical Association who graduated at recognized medical schools are eligible to apply for Fellowship.

To qualify as a Fellow, a Member in good standing is required to make formal application for Fellowship, to pay Fellowship dues and to subscribe for *The Journal*. Applications must be approved by the Judicial Council. Fellowship dues and subscription to *The Journal* are both included in the one annual payment of $8.00, which is the cost of *The Journal* to subscribers who are not Fellows.

Only those Members who qualify as Fellows are eligible for election as officers; none but Fellows may serve as Members of the House of Delegates; none but Fellows may register at the annual sessions of the Association or may participate in the work of its scientific sections.

Members of state medical associations pay dues to those bodies, but they pay nothing to the American Medical Association. Fellows pay dues and subscription to *The Journal* in the sum of $8.00 a year, which has nothing to do with county or state dues.

According to the amendment to the By-Laws of the American Medical Association, no Member may hold membership in two state medical associations concurrently.

Application form for Fellowship may be obtained by request directed to the American Medical Association, 535 No. Dearborn Street, Chicago, Ill.

MISSISSIPPI VALLEY MEDICAL SOCIETY 1941 ESSAY CONTEST

The Mississippi Valley Medical Society offers annually a cash prize of $100.00, a gold medal, and a certificate of award for the best unpublished essay on any subject of general medical interest (including medical economics) and practical value to the general practitioner of medicine. Certificates of merit may also be granted to the physicians whose essays are rated second and third best. Contestants must be members of the American Medical Association who are residents of the United States. The winner will be invited to present his contribution before the next annual meeting of the Mississippi Valley Medical Society at Cedar Rapids, Iowa, Oct. 1, 2, 3, 1941, the Society reserving the exclusive right to first publish the essay in its official publication — the MISSISSIPPI VALLEY MEDICAL JOURNAL (incorporating the RADIOLOGIC REVIEW). All contributions shall not exceed 5000 words, be typewritten in English in manuscript form, submitted in five copies and must be received not later than May 1, 1941. The winning essay of the 1940 contest appears in the January, 1941 issue of the MISSISSIPPI VALLEY MEDICAL JOURNAL (Quincy, Ill.) Further details may be secured from Harold Swanberg, M. D., Secretary, Mississippi Valley Medical Society, 209-224 W.C.U. Building, Quincy, Illinois.

THIRD ANNUAL CONGRESS ON INDUSTRIAL HEALTH

Wednesday, January 15, 1941

CLINICS AND DEMONSTRATIONS IN INDUSTRIAL MEDICINE, HYGIENE AND TRAUMATIC SURGERY

Arranged By

THE CHICAGO MEDICAL SOCIETY

Carnegie-Illinois Steel Corporation

South Chicago, Illinois and Gary, Indiana

Dr. Philip Kreuscher and Associates

Clinic and demonstration available to a limited number of physicians and surgeons interested in care of the injured. Program includes

1. Treatment of Fresh Wounds.
2. Treatment of Burns. (Motion Picture)
3. Fracture Management
4. Prevention and Management of Heat sickness.
5. Prevention and Treatment of Carbon Monoxide Poisoning.
6. Demonstration and Discussion of Safety Methods.
7. Plant Inspection.

Transportation will be provided leaving the Palmer House at 9 a. m. Luncheon available on the plant premises. Apply for tickets and complete program at Registration Desk of the Third Annual Congress on Industrial Health, Palmer House, January 13-14

University of Illinois College of Medicine

1853 West Polk Street, Chicago

10 a. m. Clinic and Symposium on Industrial Dermatosis. Francis E. Senear, M. D. Presiding.

Criteria for diagnosis, diagnostic technics and dem-

onstration of patients arranged with the assistance of the Joint committee on Industrial Dermatoses of the Section on Dermatology and Syphilology of the American Medical Association, and of the American Dermatological Association.

2 p. m. Symposium on Occupational Diseases. Lloyd L. Arnold, M. D. Presiding.

The Industrial Hygiene Survey

An outline of tested procedure to detect and evaluate industrial health exposures, adaptable to both large and small plants.

K. M. Morse, Industrial Hygienist
Illinois State Department of Public Health

Principles of Control over Industrial Health Exposures.

A description of progressive steps necessary to control industrial health exposures.

Donald E. Cummings, Dir. Division of Industrial Hygiene, University of Colorado School of Medicine and Hospitals, Denver.

Pitfalls in Occupational Disease Diagnosis.

A discussion of ways in which occupational intoxications simulate other diseases, with emphasis on differential diagnosis.

M. H. Kronenberg, M. D. Chief of Division of Industrial Hygiene, Illinois State Department of Public Health.

Occupational Disease Testimony.

Instruction for the physician in effective presentation of medical testimony on occupational diseases before workmen's compensation administrators.

James J. McKenna
Chicago

At convenient times during the day there will be demonstrations of laboratory and field equipment used to detect and evaluate industrial health exposures. These demonstrations are arranged by the Division of Industrial Hygiene of the Illinois State Department of Public Health.

6:30 P.M. Dinner, Chicago Women's Club

8:00 P.M. Evening Program

Industrial Health — A Medical Opportunity
Stanley J. Seeger, M. D., Chairman, Council on Industrial Health, American Medical Association.

Medical Service for the Small Plant
Anthony J. Lanza, M. D., Assistant Medical Director Metropolitan Life Insurance Co., N. Y.

The Control of Syphilis in Industry
Harold A. Vonachen, M. D., Medical Director, Caterpillar Tractor Company, Peoria.

WOMAN'S AUXILIARY TO THE ILLINOIS STATE MEDICAL SOCIETY

Report of the Eighteenth Annual Meeting of the Woman's Auxiliary to the American Medical Association

As President of the Woman's Auxiliary to the Illinois Medical Society, it was my privilege to be a delegate to the National Convention held in New York City June 10th to 14th, 1940.

The courtesies shown to the visiting auxiliary members and guests by the New York ladies will long be remembered.

The Auxiliary members of Illinois were especially proud of our own Mrs. Rollo K. Packard who presided so graciously and efficiently as President of this Convention.

The general sessions were extremely instructive and well attended. It was an inspiration to this chairman to meet the State Presidents, and to confer with them regarding our various problems.

I am happy to report that it was the largest convention ever held. The registration chairman reported at the second session a total attendance of 908.

It would require many pages to outline and describe in detail the sessions and social functions enjoyed by the visiting ladies.

The following is a brief summary of the activities:

Sunday afternoon, June 9th, a tea in honor of Mrs. Rollo K. Packard was given at Sherrys. There were over 100 present, among them many distinguished guests.

Monday morning, June 10th, a pre-convention meeting of the Board of Directors was held with Mrs. Packard presiding. At 7:00 P.M. the Board of Directors were guests of the Woman's Auxiliary to the Medical Society of the State of New York, at dinner, in the Empire Room of the Waldorf-Astoria.

Tuesday morning, June 11th, the first session was called to order in the ballroom of the Hotel Pennsylvania at 9:30 A.M. A total of 552 were present. This session recessed at 12:15 to reconvene after luncheon. This luncheon was held at 12:30 in the rose and silver banquet room of the Hotel Pennsylvania, in honor of the past presidents of the Auxiliary, with an attendance of 396. Addresses were given by Dr. Rock Sleyster and Dr. Morris Fishbein.

The second session reconvened Wednesday morning at 9:45 A.M. with a total of 908.

"In Memoriam" service was read by Mrs. Frank M. Haggard of Texas, to the accompaniment of appropriate piano music played by Mrs. Walter Cane, a member of the Nassau County Auxiliary.

The meeting recessed at 12:30 o'clock to reconvene after luncheon which was held at 1:00 o'clock in honor of the President, Mrs. Rollo K. Packard, with an attendance of 256.

The President announced that Father Alphonse M. Schwitalla, Dean, St. Louis University School of Medicine, was unable to be present, due to cancellation of airline schedules. Addresses were given by Dr. Nathan B. Van Etten, President elect of the American Medical Association, and Dr. C. G. Heyd, Past-President of the American Medical Association.

Mrs. Harry Dooley, President of the Woman's Auxiliary to the Illinois State Medical Society, presented Mrs. Packard with a silver tray, a gift from the members of the State Auxiliary. Mrs. A. I.

Edison, delegate from Illinois, presented Mrs. Packard with a basket of flowers from the Woman's Auxiliary to the Chicago Medical Society.

This gala week closed with the annual dinner which was held at 6:30 o'clock, Thursday evening, in the Hotel Pennsylvania roof garden. This dinner preceded the President's Reception and Ball held at the Waldorf-Astoria, where the American Medical Association was host.

Marion Dooley, President

WOMAN'S AUXILIARY COUNTY NEWS

Will-Grundy was honored to have as their guest, Nov. 11th, State President, Mrs. Harry Dooley. The meeting was held in the home of Mrs. W. S. McSweeney, 901 Glenwood Ave., Joliet, Ill. Following a dessert luncheon, the president, Mrs. G. H. Woodruff, presented the guest speaker, Mrs. Dooley, who spoke on "The Benevolence Fund." Assisting Mrs. McSweeney were, Mesdames L. J. Wilhelmi and Robert Lennon.

The following evening the members of the Auxiliary were guests of the Catholic Women's League. The speaker, Dr. Clifford J. Barborka of the Illinois Medical Society discussed the subject "Diet."

Peoria County had the extreme pleasure of being entertained by the Board of the Municipal Tuberculosis Sanitorium, Nov. 12. Thirty-five members enjoyed a tour of the grounds and buildings, after which dinner was served. Mrs. O. E. Barbour, President conducted the business meeting.

Miss Zoe Velde, Sec'y, of the Peoria T. B. Christmas Seal Sale spoke on the Sale, and Dr. Maxim Pollak, told about the treatment and care of the patients and the management of the Sanitorium. The Chairman and Co-Chairman were Mrs. Carl Sibilsky and Mrs. James Walsh.

Adams County Auxiliary, held their Nov. meeting in the parlors of the Hotel Lincoln-Douglas, Quincy, Ill. The President Mrs. J. F. Ross, presided. Fifteen members and one guest were present. In the absence of Dr. R. A. Harris who was to have been the guest speaker, Mrs. Harris read his paper, on the "History of Medicine and Anesthesia." Hygeia was reviewed.

On Nov. 26th Mrs. Harry Dooley, State President addressed the group on the "Aims of the Auxiliary," and the "Benevolence Fund."

Cook County, Woman's Auxiliary to the Chicago Medical Society held a meeting in the Narcissus Alcove at Marshall Fields, on Dec. 4th, Honoring the Branch Hygeia Chairmen. There were forty-four members and two guests present. Following the luncheon, the president, Mrs. Bornemeier, introduced the chairmen and then turned the meeting over to the Program chairman, Mrs. J. Soukup, who presented the guest speakers.

Mr. Chas. S. Mohler, Advertising Manager of *Hygeia,* gave some very interesting statistics on *Hygeia* and told of its far-reaching influence in doctors offices. Two independent surveys were made showing an approximate readership of 2,000,000, in doctors offices each month.

Miss Agnes Fletcher, of Calumet High School, spoke of the valuable influence of Hygeia upon the pupils. In this school alone, forty copies per month are used to supplement regular text-books on Physical Education.

We are very proud of the fact that the National Hygeia chairman, Mrs. W. J. Wanninger and the State Hygeia chairman, Mrs. E. M. Egan are from Cook County.

Bureau County, held a regional meeting in connection with the annual North Central Ill. Medical Association, on Dec. 5th at Princeton, Ill.

The program included a Tea in the home of Dr. and Mrs. M. A. Nix, in honor of Mrs. Harry J. Dooley, State President and guest speaker of the evening. Dinner was served at the Presbyterian Church.

The president, Mrs. A. B. Troupa and the Chairman, Mrs. M. A. Nix, conducted the evening meeting. Mrs. Dooley gave an address on "The Aims and Purposes of an Auxiliary," and Dr. Harold Camp, of Monmouth, Ill., spoke on "What the Auxiliary Can Do to Help Medicine."

TRI-COUNTY

(Johnson, Pope, Massac)

It is with a great deal of pleasure that we welcome a new Auxiliary, Tri-County, representing, Johnson, Pope, and Massac Counties, located in the most southern portion of our Great State. You are joining us at a time when you can do much in helping to carry forward a program of many important projects. If Medicine, which we all love, is to be preserved as an institution based upon the sound principles upon which it was built and progress under new and heavy demands, all of our strength must be mustered, to help direct it along its proper course. We welcome you into our association, Tri-County, we salute you as a new company in our army, Medicine Must Go Forward.

The Officers and Chairmen are as follows:

Pres., Mrs. Warner A. Gray, Metropolis, Ill.
Vice Pres., Mrs. L. S. Barger, Galconda, Ill.
Sec'y., Mrs. W. J. Anderson, Jr., Vienna, Ill.
Treasurer, Mrs. J. A. Ward, Metropolis, Ill.
Historian, Mrs. E. A. Veach, Vienna, Ill.
Membership, Mrs. V. M. Timm, Metropolis, Ill.
Publicity, Mrs. J. A. Fischer, Metropolis, Ill.
Program, Mrs. W. J. Anderson, Jr., Vienna, Ill.
Hygeia, Mrs. C. H. Miller, Vienna, Ill.
Public Relations, Mrs. Stephen P. Ward, Galconda, Ill.
Benevolence, Mrs. V. O. Decker, Metropolis, Ill.
Revisions, Mrs. J. H. Gann, Brookport, Ill.
Legislative, Mrs. W. Thompson, Cypress, Ill.
Social, Mrs. J. A. Ward, Metropolis, Ill.

Mrs. C. W. Stuart
Chairman, Press & Publicity
330 N. Austin Blvd.
Oak Park, Ill.

ASA S. BACON TO RETIRE AS SUPERINTENDENT OF PRESBYTERIAN HOSPITAL

After more than 40 years of service at Presbyterian Hospital, Asa S. Bacon will retire as superintendent on January 1, 1941, it was announced today by John McKinlay, president of the hospital. Mr. Bacon's successor will be J. Dewey Lutes, who has been superintendent of Ravenswood Hospital for the past nine and one-half years and is well known in activities of hospital organizations.

"In appointing Mr. Lutes the hospital board feels that it has chosen a forward-looking hospital executive whose nineteen-year record of successful hospital administration indicates that he is well qualified to take the helm at Presbyterian Hospital."

"Mr. Bacon's long record of outstanding service at Presbyterian Hospital and his broad interest in the improvement of hospital service generally have made him a national figure. His more than 40 years' tenure in one institution spans a period of unprecedented advances in both medical science and hospital service, and with his own thinking as a hospital executive has kept pace and often been in the vanguard.

Mr. Bacon is known in hospital circles as the originator of many improvements in hospital service. He is a trustee of the American Hospital Association and has been its treasurer for 35 years, with the exception of one year when he served as president. In recognition of his long service, the Association last February named its reference library at 18 East Division St. the Asa S. Bacon Library.

During his nearly ten years as superintendent at Ravenswood Hospital Mr. Lutes has brought about many improvements in the hospital and its service. The number of admissions has grown to such an extent that the institution now needs larger quarters. Physical improvements and new equipment have increased the value of the hospital plant by $250,000.

Early in his hospital career Mr. Lutes recognized the need for improvements in hospital administration and business practices. In line with this thinking he joined Mr. Bacon as a co-founder of the Chicago Hospital Association and became its first president. The Association is now known as the Chicago Hospital Council. Mr. Bacon and Mr. Lutes also have been closely associated as co-founders, charter fellows, and officers of the American College of Hospital Administrators, which has done much to raise professional standards in the United States and Canada. Both are directors and Mr. Lutes is vice-president of the Hospital Service Corporation of Chicago (Plan for Hospital Care). Mr. Lutes is a trustee and former president of the Hospital Association of Illinois and a member of the house of Delegates of the American Hospital Association.

Doctor (after examination): "Madam, you have a constitution of iron."

Obese Patient: "I have often wondered what made me so heavy."—*Butchers' Advocate and The Food Merchant.*

ALITIC PARKINSONISM

P. Solomon, R. S. Mitchell and M. Prinzmetal (*Journal A. M. A.*, 108:1765 (May 22) 1937), report a series of twenty-eight cases suffering from classic post-encephalitic parkinsonism were treated with either "Benzedrine Sulfate" (benzyl methyl carbinamine sulfate, S. K. F.) alone or with the addition of scopolamine or stramonium. Results according to symptoms are as follows:

Symptom	Lack of Energy	Inability to work	Lack of Strength	Tremor	Rigidity	Drowsiness	Oculogyric Crisis
No. of patients exhibiting symptoms	26	28	26	16	26	24	8
% improved as to symptoms.	96%	79%	73%	44%	77%	95%	100%

Fifteen, or 53 per cent, were improved from "Benzedrine Sulfate" alone and twenty-six, or 93 per cent, reported improvement from "Benzedrine Sulfate" with the addition of stramonium or scopolamine. "Benzedrine Sulfate" was found to be most effective when used in combination with these two drugs. Results in oculogyric crisis were particularly striking. This symptom was eliminated in six and greatly diminished in two of the eight patients subject to these attacks.

Additional experiments were tried with ten cases of arteriosclerotic parkinsonism and in a selected group of twenty-two psychoneurotic. Results were not favorable in these conditions and in some cases untoward effects developed.

The average maintenance dose in post-encephalitic parkinsonism was 10-20 mg. two or three times a day, although as much as 160 mg. a day for three weeks was taken by one patient without apparent harm. No evidences of tolerance or habit-formation were observed.

Diabetes Mellitus

Yesteryear—Insulin therapy established. Low carbohydrate diet.

Today—Protamine insulin has been developed This gives longer sustained action and permits less frequent administrations than with insulin. Higher carbohydrate diet.

Buerger's and Raynaud's Disease

Yesteryear — Only general therapeutic measures known.

Today—Now fever therapy, diathermy, resection of sympathetic ganglia and the use of the Pavaex machine have definitely aided in the therapy.

Endocrinology

Yesteryear—Endocrine therapy chiefly empiric.

Today—Now a definite established basis that the pituitary gland is the key gland. Discovery and proven therapeutic value of Cortin, Antuitrin-S, Theelin, Thyroxin, Parathormone and Insulin. Established relationship of parathyroid tumor to bone disease. Recognition and treatment of the symptom-complex of hyperinsulinism, basophilic adenomata of pituitary and adenomata of suprarenals.

Original Articles

THE TREATMENT OF CUTANEOUS VASCULAR NEVI. (HEMANGIOMAS)

FRANK E. SIMPSON, M. D.
Collaborators
J. E. BREED, M. D.
J. S. THOMPSON, Ph.D.
CHICAGO

Vascular nevi are tumors composed of newly formed blood vessels supported by a variable amount of connective tissue.

The most striking feature of cutaneous vascular nevi is their color which is always some shade of red or blue.

A subcutaneous vascular nevus may cause a localized bulging of the overlying skin which may be reddish, bluish or of normal skin color.

Usually congenital, a vascular nevus may appear a few days or weeks after birth and very rarely in later life.

Once it has appeared, a nevus may remain stationary or grow — rapidly or slowly.

A nevus may resolve spontaneously but one should not delay treatment for more than a few weeks in anticipation of its disappearance.

Growing nevi should be treated immediately. Ulcerating or bleeding nevi should also receive immediate treatment.

Involving the lips, a nevus may hinder nursing and if it presses on the neck may obstruct swallowing and breathing and seriously affect nutrition.

In such nevi, immediate treatment is indicated.

METHODS OF TREATMENT

Prior to the advent of radium, attempts were made to remove nevi by many different methods. They were excised, burned with the cautery, frozen with liquid air or carbon dioxide snow, injected with boiling water or chemicals, cauterized with nitric acid or other substances, destroyed by electrical methods, treated with x-rays, etc.

Many of these methods were very painful and some were actually dangerous.

Frequently the nevus was made more unsightly by the production of scars, keloids, contractures or an uneven color.

RADIUM TREATMENT

At the present time, radium treatment is the method of choice in most vascular nevi, although surgery in pedunculated nevi, electrolysis in "spider" nevi and the Kromayer lamp in faintly colored port wine "stains" are also of great value.

Between 1912 and 1940, a period of 28 years, we treated with radium more than 660 cutaneous vascular nevi. Many of these cases have been under periodic observation since the beginning of treatment.

In some cases, little improvement was brought about.

In a majority of cases, there was a marked change for the better.

In favorable cases, the nevus resolved leaving little or no trace behind.

Methods of Using Radium. Two different methods of using radium have been advocated — 1. surface application 2. radium "puncture." We mention the latter method only to condemn it. In our opinion, radium "puncture" should never be used in cutaneous vascular nevi.

Surface Application. (a) Radium plaques. This type of apparatus was devised in 1905 by Wickham and Degrais of Paris.

Radium plaques are made of metal or some soft material such as linen or rubber, on which the radium salt is evenly spread.

Plaques vary in diameter from 1 to 4 or more cm., the shape being usually round or square.

They may contain from 5 to 50 or more mg. of radium element.

Linen or rubber plaques are known as "toiles." A "toile" may be placed in close contact with the skin or at a distance of two or more mm., by interposing flexible rubber sheeting between the "toile" and the skin. The latter method is preferable.

The metal screening on the face of the "toile" may be 1/10 mm. of lead, although screens of different metals and thicknesses may be used.

The great advantage of "toiles" is their flexibility, which permits of their being bent to the contour of the skin surface.

The chief disadvantage of "toiles" is their fragility.

Due to the constant bombardment of the linen or rubber base by the rays, "toiles" may crack or disintegrate after some months or years and must be remade.

There is also some danger of loss of the radium.

As a substitute for the "toile," one can make up an applicator with glazed radium plaques.

Assume an area of 16 sq. cm. is to be treated.

Flexible rubber sheeting measuring 4 x 4 cm. and 2 mm. thick may be used as a base for the applicator.

A screen of lead foil 1/10 mm. thick is placed on the rubber sheeting although other screens of different metals and thicknesses may be used to suit individual cases.

Four glazed radium plaques, each measuring 2 x 2 cm. and of ¼ strength, are laid, face down, on the lead foil and secured with adhesive tape.

The whole apparatus is then wrapped in rubber dam.

This applicator gives a uniform radiation effect and can be bent, though somewhat imperfectly, to conform to the contour of the skin surface.

A backing of sheet lead, 1 mm. thick, may be used to hold the applicator in position after it is bent.

(b) Radon "bomb."

This apparatus may contain 1000 or more mc. of radon, screened with 2 mm. of silver.

In the practical application of the radon "bomb," a balsa wood block, measuring e.g. 6 x 6 x 6 cm., is first strapped to the skin with adhesive tape.

A movable, lead shield with 4 sides, open at the top and bottom and operated by means of a counter-weight, is then lowered around the balsa wood block so as to enclose it laterally.

A flat, metal box, containing the radon tubes laid side by side, is then placed inside the lead shield through the opening in the top and allowed to rest on the balsa wood block.

The sides of the lead shield protect both patient and operator from the lateral rays.

While the distance of the radon from the skin may be varied by using balsa wood blocks of different heights, it should seldom be less than 6 cm. unless one has had special experience with the method.

Fig. 1. Dark red vascular nevus — group 4 — girl 6 weeks old. Sept. 1913. Referred through the courtesy of Dr. David Lieberthal.

Fig. 2. Patient in Fig. 1. 26 years after radium treatment. Oct. 1939.

PRECAUTIONS

During radium treatment, normal areas, such as the eyes, etc., should be protected with pieces of lead or gold.

Undesirable effects from radium should be carefully guarded against by taking infinite pains with the technic.

Principles of Technic. The object of treatment is chiefly to decolorize evenly and in many cases to level the nevus, so that it will be less conspicuous.

Inflammatory radium reactions should be avoided.

Marked inflammatory reactions may result in later months or years in telangiectasia, atrophy or other sequellae which ruin the cosmetic effect.

Even very small doses, insufficient to produce inflammatory reactions, may cause similar results if treatment is persisted in over long periods of time.

Minimum dosage should always be given at the beginning of a course of treatment until the sensitivity of the skin and the results have been noted. Infants should not be given over one-third or one-fourth the dosage permissible in adults.

Subtle changes in the skin and the nevus may go on long after radium treatment has been stopped.

If a second course of treatment is necessary, it should not be given until at least several months have elapsed and the dosage should always be less than that employed in the first course.

As vascular nevi of different types may be present in the same tumor the technic must be carefully adapted to the character of the area under treatment.

Technic in Special Groups. Group 1. In flat, superficial nevi, which fade momentarily on pressure, the radium plaque technic may be used.

A total of from 3 to 4 hours may be given in half-hour seances on successive or alternate days.

Inflammatory radium reactions should be avoided.

Group 2. In flat, infiltrated nevi, which do not fade momentarily on pressure, the radium plaque technic may be used with slightly larger dosage than that permissible in group 1.

A very mild radium reaction — slight erythema and scaling — may cautiously be produced. Reactions should rarely be repeated.

Group 3. In elevated, hard nevi, which do not fade momentarily on pressure, the radium plaque technic may be used with slightly larger dosage than that permissible in group 2. The precautions about reactions previously mentioned should be observed.

Fig. 3. Subcutaneous and cutaneous vascular nevus — groups 4 and 5 — girl 11 months old. July 1930.

Fig. 4. Patient in Fig. 3. 10 years after radium treatment. Oct. 1940.

Group 4. In elevated, soft nevi, which fade and recede momentarily on pressure, the radium plaque or the radon "bomb" technic may be used.

In nevi that project only a few mm., the radium plaque technic may be used; in those that project several cm., the radon "bomb" should usually be employed.

With the radium plaque technic, a total of from 6 to 8 hours may be given in half-hour seances on successive or alternate days.

With the radon "bomb" technic, a total of approximately 3000 mc. hrs. may be given at a distance of 6 cm. in 12 seances on successive

or alternate days. Inflammatory radium reactions should be avoided.

In this group, the results of radium treatment are superior to those obtainable by any other method

Group 5. In deep subcutaneous nevi, the radon "bomb" technic should be used.

A total of approximately 5000 mc. hrs. may be given at a distance of 7.5 cm. in 12 seances on successive or alternate days.

Inflammatory radium reactions should be avoided.

In this group, the results of radium treatment are superior to those obtainable by any other method.

Fig. 5. Bluish-red vascular nevus — groups 4 and 5 — boy 5½ months old. Feb. 1938.

Fig. 6. Patient in Fig. 5. 2¾ years after radium treatment. Oct. 1940.

DIFFICULTIES

Some of the difficulties in getting a good cosmetic result are:

1. In infants, the nevus by reason of neglect may be allowed to progress and cause destruction of tissue and scar formation.
2. There may be a marked deformity due to the presence of a large amount of connective tissue in the tumor. While the color may be improved in such cases it may be impossible to remedy the deformity completely.
3. In many cases, previous treatment with radium or other agents may have ruined the texture of the skin.

Bad effects from radium are almost always due to too strong doses or to crude methods of using it.

ADVANTAGES OF SURFACE RADIUM TREATMENT

1. There is no pain. During treatments infants frequently take their daily nap.
2. Treatment may be begun in earliest infancy.

There is no ground for the statement that babies should reach a certain age, e.g. 2 or 5 years, before radium treatment is begun.

In our opinion, the earlier babies are treated the better.

Some of our best results have been obtained in infants in whom treatment was begun at the age of a few weeks.

A nevus present at birth or appearing shortly after should be carefully observed. If it does not show a tendency to subside quickly it should be treated without delay.

In some babies, in whom involvement of the lips hinders nursing or pressure on the throat obstructs swallowing or breathing, danger to life may be averted by prompt treatment.

3. In selected cases, the results of radium treatment are excellent and superior to those obtainable by any other method.

The secret of cosmetic success lies in the avoid-

ance of inflammatory radium reactions.

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POSTOPERATIVE THROMBOSIS AND EMBOLISM

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Postoperative thrombosis and embolism continue to be one of the unexpected, dreaded and seemingly unavoidable complications of surgery. While there has been a gradual reduction in mortality following major surgical procedures, owing to better preoperative care, improved technic, better anesthesia and alert postoperative management, the incidence of postoperative thrombosis and embolism has not decreased. On the contrary, a number of statistics have become available during the last ten years, registering an increased frequency of this complication. Burke[1] has succinctly enumerated the factors which in his opinion are responsible for this increase as follows:

1. Lengthening of the average life expectancy, 2. consequent increase in number and longer survival of cardiovascular patients, 3. increase in the hospitalization of patients, the practice of "going to bed" with less provocation than in hardier days, 4. larger volume of surgery on aged and handicapped patients, and 5. greater use of intravenous therapy and diuretics.

Whatever other causes there may be, the problem is with us and it behooves every surgeon to institute measures which reasonably diminish the incidence of thrombosis effectively, treat the thrombosis once it has occurred, attempt to prevent embolism and treat it with all available means.

This is an ambitious program and in order to have any results at all, the measures must be simple and capable of being carried out in any general hospital.

The Prevention of Postoperative Thrombosis: It is generally known that advanced age, obesity, and operations requiring laparotomies raise the incidence of embolism. Of our own series recently studied by Jesser[2] pelvic laparotomies were followed by far the largest percentage of pulmonary emboli. A collective review of the more recent statistics is given by Ochsner and DeBakey.[3] Here we are interested in a general way in factors that predispose to thrombosis with the idea of eliminating or correcting them if possible.

Hemoconcentration. Whenever blood loses some of its fluid content, so that its red cell count becomes high, together with its viscosity and specific gravity, the clotting tendency is increased. This not only occurs in dehydration due to vomiting, inability to take liquids by mouth or diarrhea, but is typical of the delayed, secondary shock following operation or burns. Hemoconcentration is also present in states were blood proteins are diminished as the fluid then will pass out into the tissues, as in nephrosis, in peritonitis or large fibrinous exudates in the pleural cavity. This hemoconcentration is most readily detected by a red cell count and hemoglobin determinations, although recently a simple apparatus for the determination of specific gravity has also become available. Whenever

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May 22, 1940. From the Department of Surgery, University of Illinois, and St. Luke's Hospital, Chicago.

hemoconcentration is detected its correction must be attempted by the restoration of fluid balance and of blood proteins; should they be below 6 grams per 100 cc. of blood. It perhaps is not generally appreciated that every major operation is followed by a temporary hemoconcentration due to a subclinical shock. The extent and duration of this may become an important factor in postoperative thrombosis and is now being investigated by Rosenthal and Lambert of the University of Illinois.

A typical example of the effect of hemoconcentration on vascular clotting is seen in polycythemia. Here coagulation time is short and thrombosis frequently occurs both in the arterial and venous sides. In a severe burn, seen with Dr. Paul Greeley, I have observed a spontaneous arterial thrombosis in a young man with an intact vascular system.

Clotting time can be easily determined in any hospital laboratory and may have comparative value, although accurate determinations require the elimination of many factors. The determination of the clotting index according to Bancroft, Stanley-Brown and Quick is capable of detecting potential "clotters" preoperatively. According to their latest report[4] 12 per cent of all surgical patients have a high clotting index and such patients should be treated with special care. At present, however, the method is not simple enough to warrant its general adoption in all hospitals. The authors advocate the intravenous injection of 10 cc. of 10 per cent sodium thiosulphate for three successive days. When the clotting index remains high the series may be repeated.

I have no experience with the clotting index; the sodium thiosulphate injections, however, have given remarkable results in cases of migrating phlebitis with segmental thromboses. The mechanism of this effect is far from being clear.

Slowing of venous return. The drainage of venous blood from the lower extremities and pelvis is measurably retarded after operations. Factors responsible for this are: 1. fall in arterial pressure, 2. decreased diaphragmatic excursions which greatly influence the emptying of the vena cava, 3. increased intra-abdominal pressure owing to distention and tight dressings, and 4. Fowlers position which creates a venous pool in the pelvis. When arterial pressure is maintained, ventilation encouraged with sufficient postoperative sedative, postoperative atony relieved with prostigmin or acetylcholine, tight dressings not tolerated and the Fowler's position possibly eliminated by a moderate Trendelenburg position for the first 48 hours, we have done much to encourage venous return. Of course the most potent stimulus for venous backflow is active muscular movement and the patient should be encouraged to do this from the third day on until he or she is ready to get up. Thyroid extract given to speed up circulation has not prevented thromboses. Prolonged immobilization, such as becomes unavoidable in very sick patients or following certain fractures, always carries a higher incidence of thrombosis and embolism.

In case of a suspected or manifest thrombosis the exercises are naturally stopped. There seems to be no reason, however, to discontinue the elevation of the foot of the bed; better drainage should diminish the incidence of thrombi propagating from the site of venous occlusion.

The meterologic factor. Recently Mayne, Petersen and I[5] correlated the occurrence of 100 cases of pulmonary embolism with meterologic charts and with fluctuations of environmental temperatures. While it is obvious that many other predisposing and precipitating factors are known to operate in cases of embolism, the weather factor is one which readily lends itself to registration. During the spring and fall periods, which showed marked barometric and thermal fluctuations, actually more emboli occurred and the summer months were comparatively exempt. The effect of marked deviations from the mean temperatures for any particular period also seemed to bear influence on the mobilization of blood clots. While this study was primarily undertaken to study the influence of weather on embolism, the effect on the thrombosis preceding it is equally unmistakable.

It seems as if thrombosis and embolism would be much less frequent in the South than in the North.[3] At present we cannot free our patients from the effects of the weather; however, one can diminish the bodily reactions to the weather by sedatives and antispasmodics, the role of which will be discussed later.

THE EARLY RECOGNITION OF POSTOPERATIVE THROMBOSIS

The classic description of pain in the groin, marked livid and later pallid swelling of the

limb with a rise in temperature and pulse rate need not be repeated here. More important are early premonitory symptoms which may later be followed by the manifest thrombosis or remain latent abortive types of phlebitides. This group of patients is more endangered by embolism than those in which a large "milk leg" has appeared. In fact it has been my experience as well as that of others that once a milk leg has appeared the danger of embolism is slight.

A small rise in the evening temperature, a persistently elevated pulse rate without any detectable cause should cause one to look around after the fourth to fifth postoperative day for other signs and symptoms of latent thrombosis. These are 1. an elevation of skin temperature of the sole of the foot on the affected side, 2. pain on pressure in the sole of the foot, in the calf muscles, in the popliteal space on dorsiflexion of the foot, or in the groin, 3. a slight edema of the groin or suprapubic region, 4. frequent urination or mucous stools, and 5. pain in the small of the back. The three last symptoms are suggestive of pelvic thrombosis, while the location of pressure pain often denotes the site of the original thrombus which, if it remains localized, may not progress to a manifest thrombosis.

There are, however, postoperative blood clots in which even these premonitory signs and symptoms are missing. The patient may show a smooth postoperative course with no rise in pulse and temperature, no pain or swelling; most of the fatal pulmonary emboli originate from just such thrombi. Their location is either in the muscle veins of the calf or in the large pelvic plexuses.

THE EARLY TREATMENT OF POSTOPERATIVE THROMBOSIS

The objectives of treatment are to free the limb of the edema and to protect the patient as far as possible from propagating thrombosis and embolism. The footend of the bed is elevated six to eight inches on shockblocks. The limb is fomented from toes to groin with warm wet dressings. Heat cradles are dangerous as the edematous limb blisters very easily and may even lead to gangrene. If a heat cradle is used it is better to apply it to the groin and over the abdomen. If the limb is cold and the toes quite pallid, a block of the lumbar sympathetics may be performed with procaine which abolishes reflex vessel spasm. The average case, however, will respond to a reflex heat from an abdominal cradle. Liquids are restricted to 1000 cubic centimeters for a few days and a salt poor diet is prescribed. Both of these measures help to prevent retention of fluid in the affected limb. While further dehydration may be accomplished with mercurial diuretics, which I have previously advocated, it should be remembered that too much dehydration may result in hemoconcentration. Thus while edema is then diminished the tendency to ascending thrombosis is facilitated. It is better then to restrict the use of salyrgan or mercuprin to patients in whom daily blood counts and coagulation times are available.

Under such conditions edema usually subsides within a few days. The important problem then is to prevent embolism if possible. With the use of intravenous heparin, as described by Murray and Best,[6] the clotting time can be lengthened to three times its normal value. If this medication is maintained for about two weeks the formation of new thrombi, which constitute the real source of embolism, can be inhibited. This is particularly striking in patients who have had recurrent pulmonary infarcts, as recently seen in a patient with Dr. Joseph T. Gault.

Because of the expense of obtaining purified heparin other anticoagulants may be used. Leeches may occasionally lengthen coagulation time but their use is cumbersome and unless kept up continuously embolism will occur a few days after they are discontinued. This happened in a patient suffering from polycythemia who died of pulmonary embolism on the sixth day following amputation. Leeches were used the first two days after operation.

In patients who exhibit marked periphlebitic reactions characterized by high temperature, leucocytosis and inflammatory edema, the value of x-ray treatment has been unquestionable. This treatment should be given in the typical iliofemoral phlebitis over Scarpa's triangle and the lumbar paravertebral space on the affected side. When the phlebitis occurs in the saphenous vein with distinct periphlebitic red streaks, the results of x-ray treatment are demonstrable to the naked eye. The effect of Roentgen rays is not on the clot itself but on the lympocytic infiltration in the adventitia, which in turn is responsible for most of the reflex vascular spasm and pain occurring in phlebitis. The more acute the process, the smaller the dose; 80-100 Roent-

gen units with a heavy filter should not be exceeded. The results in the subacute and chronic cases are not so striking and the doses have to be increased. The treatment had best be repeated three times in ten day intervals. Whether it helps to organize the clot faster is not known.

When a thrombus is readily localizable and one or two pulmonary infarcts have occurred, the ligature of the vein proximal to the thrombus is advisable. The thromboses of the muscle veins and the popliteal vein as shown by Homans are especially apt to give rise to embolism. In such patients the femoral vein can be tied below the profunda without producing persistent swelling.* When the thrombus is in the iliofemoral vein the clot can be extracted through the saphenous vein opened at the saphenofemoral junction.[2] In amputations for peripheral vascular disease the popliteal vein is often thrombosed or forms a postoperative clot ascending from the site of ligature. Veal[7] has suggested the prophylactic ligature of the femoral vein distal to the saphenous vein but above the profunda. We have recently tied this vein during an amputation at the kneejoint with no residual swelling of the stump. Finally in a septic phlebitis of the leg or pelvic veins a ligature proximal to the septic thrombi may be followed by a sudden defervescence and prompt recovery.

THE PERIOD OF IMMOBILIZATION FOLLOWING THROMBOSIS

As long as the edema is marked and the patient is febrile bedrest in the Trendelenburg position is maintained. Patients with saphenous phlebitis need not be immobilized for any length of time but may get up early with adequate elastic support. The phlebitis of deep veins, however, needs longer rest. It has been our procedure to keep the patient in bed for ten days after the evening pulse has returned to its level which is normal for the individual. Then the patient is allowed to sit up, hang his feet over the bed, and perform a few flat-foot exercises for five minutes three times a day. This sometimes results in an elevation of temperature or pulse on the night of the exercise, which suggests further immobilization. However, if no reaction ensues, an Unna's glycerine-gelatin cast is applied from the toes to the groin, which is worn for three weeks and then reapplied for another three weeks. Thus many of the late sequalae of deep thrombophlebitis may be avoided.

THE LATE SEQUELAE OF POSTOPERATIVE THROMBOSIS

The hard brawny induration following deep thrombophlebitis is known to all of you. It may be prevented to a great degree by the early measures discussed in the previous paragraph. When seen late gelatin-glycerin casts give a certain comfort, but when discontinued the hard, sometimes woody induration, recurs. The same is true of iontophoresis, a method whereby vasodilators or sodium chloride are introduced through the skin with a galvanic current. Our clinic has given an extensive trial to this method and smaller indurations do respond with softening after 20 to 30 treatments; however permanent softening can seldom be accomplished. Removal of foci of infection helps to diminish the incidence of a patchy type of acute recurrent induration which leaves the patient with more and more edema and often leads to ulceration. In the treatment of such thrombophlebitic ulcerations it is again the hard fibrotic mass around the ulcer which needs to be treated, as the ulcer itself, once the induration is overcome, readily responds to treatment with gelatin casts.

The thrombophlebitic indurations may vary from the size of a silver dollar to areas encircling the entire circumference of the calf. They throttle their own blood supply, produce swelling of the foot distal to the constriction and break down easily in the center. When a stage of recurrent ulcerations has been reached the condition should be regarded as a major surgical problem. Excision of the entire area together with the underlying fascia and a skin graft immediately or a week later has often been successful. Much attention should be paid to the recent suggestion of Bancroft[8] who makes two longitudinal incisions down to the fascia, undermines and lifts up the entire area without excising it and later covers the remaining skin defects with pinch grafts. Prolonged elastic compression lasting six months to a year must follow this procedure in order to obtain satisfactory results.

PRECIPITATING FACTORS OF PULMONARY EMBOLISM

There is of course no pulmonary embolism

*In a recent case of recurrent pulmonary embolism, the femoral vein was tied below the profunda, the clot aspirated from the proximal stump and the patient was hyperinized. 3 months later he had no residual swelling.

without a preexisting thrombosis and yet the point should be made that in the majority of cases the primary source of the embolus, at least at the time of its occurrence, is unknown. The thrombus which is most apt to break loose comes from large tributaries of the femoral or iliac vein but produces hardly any clinical symptoms as it does not occlude the main vessel. However, when these thrombi from the periprostatic, perivesical, uterine veins or from the muscle veins of the calf and the popliteal space extend into the main swift current and propagate centrally, the loose, red thrombus, the tail of the clot, which is hardly fixed to the wall, breaks loose very readily. In tabulating the factors responsible for the mobilization of the clot Jesser and I have recently reported that in 30 per cent of our cases some definite immediate cause such as bowel movement, active or passive physical exertion, the milking action of a large enema, sitting up out of bed for the first time, and reverse gastrointestinal peristalsis seem to have precipitated the embolus. In 70 out of 100 cases, however, no obvious precipitating factor could be found. Mayne, Petersen and I[5] have studied the possible influence of the weather on the appearance of embolic showers and reference was made to an unmistakable correlation here with barometric pressures and changes of temperature in a previous paragraph.

THE EARLY DIAGNOSIS OF PULMONARY EMBOLISM

Many small emboli go unnoticed. Proof of this is frequent finding of emboli in the lung in patients whose clinical symptoms were not suggestive. A small stitch in the side followed by a mild dry or exudative pleurisy, a short retrosternal attack of pain, or a few minutes of dyspnea followed by a feeling of lassitude should make the surgeon suspicious of embolism. Further showers of greater magnitude and importance may follow.

In taking the nurses' records from St. Luke's and the Research and Education Hospitals one finds that the three leading symptoms are dyspnea, cyanosis and chest pain. The fall in blood pressure, which was not recorded except in the last few years, is suggested by notes such as "weak pulse," "rapid pulse," and "restlessness." Abdominal symptoms, such as pain in the epigastrium, pain in the right upper quadrant or shoulder pain often suggest intra-abdominal lesions, notably a gall bladder colic. This latter syndrome usually signifies an infarct in the right lower lobe with diaphragmatic irritation. Cerebral anemia due to the fall in blood pressure and the loss of oxygen from the blood is signified by "convulsions" or "dizziness."

The nurses' observations and records are extremely valuable as they allow the institution of simple but sometimes life-saving measures. Contrary to the customary comment, that patients either die before anything can be done or recover anyway, it can be shown in our study of 70 fatal emboli that only 8.5 per cent died in less than ten minutes, roughly 60 per cent lived more than one hour and 34 per cent lived from one to several days. There is certainly time then to institute simple, emergency measures, most of which can at least be started by the nursing staff.

THE EMERGENCY TREATMENT OF PULMONARY EMBOLISM

The question naturally arises: what can one possibly accomplish in patients whose pulmonary artery is plugged? When cyanosis and dyspnea are the predominant symptoms, oxygen by nasal catheter, or preferably in 100 per cent concentration with the new B. L. B. mask, is logical. At St. Luke's Hospital every surgical floor is equipped with an oxygen tank together with a inexpensive, nondeteriorating, cellulose-acetate mask which can be applied within a few minutes until the more permanent equipment arrives. Members of the medical staff and the administration have been instrumental in constructing this emergency outfit. The massive pulmonary embolism, however, is often characterized by pallor, retrosternal pain and fall in blood pressure; its differentiatiion from a coronary occlusion is quite difficult. As Arlie Barnes so aptly pointed out, it is necessary to avoid the obsession that cyanosis and dyspnea are the cardinal signs of pulmonary embolism.[9]

Some of the older clinicians, notably the French Roger, have made a distinction between the asphyctic and the syncopal type of embolism. The latter type closely simulates coronary occlusion. Here asphyxia is not a dominating symptom but oxygen is still useful for the dyspnea and the chest pain just as in coronary occlusions. The electrocardiogram does not well differentiate this type of embolism from coronary occlusion. In fact, some of our animal experiments interpreted by Dr. K. G. Fenn[10] would indicate that an acute coronary insufficiency exists in

these patients. Pulmonary embolism undoubtedly causes a diminution of coronary flow: 1. by the fall in the systemic pressure, 2. the dilatation of the right heart, which greatly interferes with coronary flow and 3. by vagal inhibition of the heart resulting in typical nodal rhythm, partial heart block or even standstill. These effects can all be reversed in the experimental animal with atropin.

Atropin also inhibits vagal reflexes originating from the site of pulmonary arterial obstruction and constricting the bronchi or producing gastro-intestinal spasms. As these smooth muscle spasms may greatly contribute to the causes of death, we have advocated, as originally suggested by Denk,[11] the addition of papaverine to the emergency measures. Papaverine relieves the pain, relaxes the bronchial spasm and offers the necessary sedation which these patients need. Whether it actually relieves the spasm of the pulmonary arterial tree is still unsettled and is now being investigated.*

The emergency treatment of pulmonary embolism then is carried out as follows: as soon as the nurses observe any of the cardinal symptoms discussed above, oxygen is started with the emergency mask and the permanent equipment is called for. Atropin gr. 1/60 to 1/75th is given subcutaneously and the interne staff notified. On the arrival of the interne, which at night in a large hospital may well take ten to twenty minutes, papaverine gr. ½ is given intravenously and the atropin gr. 1/75 may be repeated intravenously if no marked flushing and dilatation of the pupil exist. Both atropin and papaverine are on the surgical floor, the former in tablets and the latter in powder form; they are dissolved in sterile water or salt solution, boiled over the flame in a spoon and injected. Ampules are not always reliable in regard to their potency.

The results of this emergency treatment are sometimes dramatic. The moribund, pulseless patient may regain his color, his blood pressure rises, and his heart action improves. From then on, however, constant watch has to be kept for recurrence of attacks or relapse into the previous state. Oxygen can be kept on continuously for two to three days; papaverine and atropin can be repeated every four hours for several days until the patient's condition has decidedly improved.

It is not to be expected that every case will respond to this treatment. When the main pulmonary artery is completely plugged and some of the clots even get stuck and obstruct the origin of the artery in the right heart, the patient must die of asphyxia, failure of the right heart and lack of venous return to the left heart. There are enough post-mortem records to indicate, however, — and we have published eight of these — that patients may die from a comparatively small embolus obstructing only one lobe or part of one lobe of the lung. In the absence of other detectable causes of death reflex effects on the heart must be responsible, and it is against these that this emergency treatment is directed.

At present Dr. Fenn and I are engaged in the gathering of statistical data to study the mortality of the attack when such treatment is used. As a control we have one hundred cases of massive pulmonary embolism (not counting small infarcts) of which eighty-seven died. While our treated series is much smaller, the beneficial effect of treatment is unmistakable.

Mention should be made of the fact that if the diagnosis of pulmonary embolism is incorrect and a coronary occlusion, an acute pulmonary edema, or a cerebrovascular accident should be present, the treatment not only does no harm but is definitely beneficial. The use of morphine, digitalis and epinephrine is not recommended as they either sensitize the vagus or, in the case of epinephrine, favor pulmonary edema.

The Delayed Treatment of Pulmonary Embolism. There is a group of cases in which the patient rallies from the initial attack and then relapses again into a state of cyanosis, low blood pressure and failing right heart. These patients are not in a moribund state but are slowly failing. It may take them several hours or days to die. For this type of slowly fatal pulmonary embolism Pilcher has recommended embolectomy and I am thoroughly in accord with this indication. The successful removal of the embolus has only been possible in nine cases out 132 attempts, a mortality of 93.2 per cent. It should be pointed out, however, that these embolectomies were all performed in the rapidly fatal

*We have recently conducted some animal-experiments with Tesser and visualized the pulmonary artery during its embolic obstruction (Contr. Soc. of Clin. Research Nov. 2, 1940). Papaverine has an unmistakable effect on the pulmonary vascular bed of the dog.

cases in a moribund state. The patients, who are not moribund but just show no improvement need continuous watching with a sterile surgical set-up. Under local anesthesia the pericardium may be exposed and the flap turned back; if the patient improves, the flap can always be resutured. So far our service has carefully watched two such patients but both finally emerged from the attack without the necessity of surgical intervention.

In cases of recurrent infarcts another surgical procedure may be considered. If the patient survives one pulmonary embolus, he has, according to our figures, a 40 per cent chance of getting another one; if he survives the second one, he has a 12 per cent chance of having more of them. As a few patients have been lost as a consequence of these second or third attacks some method of preventing further emboli seems indicated. If the clot is recognizable in the calf muscles or in a lower part of the femoral vein, the ligation of the vein proximal to the clot below the profunda or below the saphenous may be done with hardly any residual edema. Homans[12] and recently Veal[7] have emphasized the value of these ligatures. Indeed as the femoral vein is so often thrombosed during or shortly after an amputation, Veal's preventive high ligation seems reasonable. The last patient on whom amputation was done without this preventive ligature died of pulmonary embolism.

A second possibility in case of recurrent iliofemoral thrombosis is to extract the clot through an opening of the saphenous vein. I have recently published such a case. There is no objection of tying even the common iliac vein for thrombi coming from pelvic thromboses but this procedure should be limited to septic thrombophlebitides in which dramatic cures have occasionally been reported.

SUMMARY

Three factors predisposing to postoperative thrombosis have been discussed, namely: hemoconcentration, the slowing of venous return and meterologic influences. Preventive measures are possible against the first two of these factors. The early signs and symptoms are described together with the early treatment, the objectives of which are the freeing of the limb from postoperative edema and the protection of the patient from propagating thrombosis and embolism. The necessary period of immobilization following thrombosis has been defined. The treatment of late sequelae of deep thrombophlebitis has been discussed. In regard to embolism, the factors precipitating it, the early diagnosis and the early treatment have been stressed. Attention has been called to reflex nervous mechanisms, the inhibition of which may be life-saving. The treatment of the slowly fatal embolus and that of recurrent embolizations has been described. While thromboses and emboli are unavoidable their early recognition and treatment may diminish mortality and morbidity.

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Dr. Michael Mason, Chicago: I am very happy to have heard this paper but I am a little embarrassed at having to discuss it. He has done so much work on vascular surgery and in this field particularly that I cannot add anything to what he has said. I think this is an extremely valuable and timely contribution. Dr. deTakats has presented a very common sense approach to the problem of postoperative thrombosis and embolism and has outlined methods of prevention and treatment. He has mentioned a number of factors that may predispose to the formation of thrombi and the release of emboli. Cutler has emphasized for years the significance of operative trauma, and points out that the one thing common to postoperative accidents of this type is the operative trauma and a surgical wound. In many instances thrombosis develops in areas not the site of the original operation. I think it is of significance, however, in this connection, since Dr. deTakats' figures show that well over 60 per cent of cases of thrombosis occur following pelvic operations; that is, operations upon the

female genitalia, or the prostate. This certainly suggests that operative trauma in the neighborhood of the large pelvic plexus of veins must be of significance.

I am glad that he emphasized the conservative management of the thrombophlebitis associated with febrile reaction. He has also mentioned many helpful things that can be done once a pulmonary embolus has occurred. We should all be encouraged by his experiences which show that the outlook is not so dark as we have assumed it to be. I think the statistics he has shown, even though, as he admits, the series is small, demonstrate the effectiveness of his treatment and substantiate the logic of his arguments.

PROGRESS REPORT ON PNEUMONIA CONTROL IN ILLINOIS

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Each year in Illinois between 10,000 and 14,000 cases of pneumonia are reported and from 5,000 to 8,000 deaths have been attributed to that disease annually in the past in ordinary years. Although this seems to reveal a fatality rate ranging from 35 per cent to 45 per cent, it must be remembered that the cases reported include pneumonias of all types and etiology. For the purpose of studying the pneumonia problem with the end in view of reducing the high mortality and high fatality rate, a state-wide pneumonia control program was inaugurated by the State Department of Public Health late in 1938.

The development of this program reached the point in January 1939 where it was practicable to begin the free distribution of antipneumococcic serum for the treatment of patients with pneumococcic pneumonia and to offer diagnostic laboratory typing service on a free or pay basis, depending on whether public or private laboratory facilities were used. During November and December, 1938, there had been established 25 approved laboratory typing stations and 10 serum distributing centers at various points in the State. Horse serum for types I, II, V, VII, VI and VIII was dispensed, and in addition, small quantities of rabbit serum for types III and IX and higher numbered types were provided for experimental purposes.

At the end of the first six months an analysis was made of the results of the program. The approved laboratories had then reported 2,171 positive pneumococcus typings, of which number 1,016 received antipneumococcic serum provided by the State Department of Public Health. The average gross mortality of these serum-treated cases was 14.1%. (See Table 1.)

Table 1. January through June, 1939.

Type	No. Cases	Deaths	Per Cent.
I	385	54	14.0
II	175	28	16.0
III	55	12	21.8
IV	60	7	11.7
V	44	6	13.6
VI	3	1	33.3
VII	143	19	13.3
VIII	93	8	8.6
IX & above	58	9	15.5
Total	1,016	144	14.1

Beginning July 1, 1939, the State Department of Public Health decided to distribute antipneumococcic rabbit serum for all types of pneumococcic pneumonia. By doing so it not only made therapeutic material available for the large number of higher types which were being reported, but also it was hoped that this would provide a stimulus for more careful and complete laboratory work.

Within the next few months, sulfapyridine proved both its effectiveness in pneumonia therapy and its relative safety if given under careful medical supervision. Therefore, by December, 1939, sulfapyridine as well as antipneumococcic serum was made available free by the State Department of Public Health on requests of physicians to all pneumonia patients whose sputa were typed in approved laboratories. An average dosage of thirty grams of sulfapyridine was allowed for each patient, while the amount of serum allowed depended entirely on the judgment of individual physicians.

Between July 1, 1939 and April 1, 1940 a total of 12,010 laboratory examinations was made on specimens taken from patients with

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Note: An advisory council on pneumonia, composed of O. H. Robertson, M.D., Chairman; M. H. Barker, M.D.; H. D. Countryman, M.D.; H. A. Durkin, M.D.; F. H. Hick, M.D.; E. E. Irons, M.D.; P. S. Rhoads, M.D.; and Italio F. Volini, M.D., has rendered very valuable service in connection with planning and executing the program from the outset.

The Illinois Department of Public Health and the Advisory Council of the Pneumonia Control Program wish to take this opportunity of expressing their appreciation to all the physicians of Illinois who have so whole-heartedly cooperated with this program. Without their help it would have been impossible not only in markedly reducing the pneumonia death rate but also in gathering this wealth of statistical material. The above report is only a preliminary statement. As soon as the analysis is completed it will be made available and published in suitable form.

pneumonia or suspected pneumonia. The amount of typing done during the second season was five times greater than that in the first season. Of these 12,010 examinations, 5,436 were positive for pneumococci. (See Table 2.)

Table 2. Total Number of Tests for Typings. July 1939 to May 1940

Type	Number	Type	Number
I	876	XVII	93
II	444	XVIII	111
III	845	XIX	231
IV	252	XX	106
V	146	XXI	38
VI	248	XXII	50
VII	414	XXIII	85
VIII	358	XXIV	59
IX	73	XXV	18
X	74	XXVI	1
XI	90	XXVII	25
XII	37	XXVIII	47
XIII	70	XXIX	68
XIV	173	XXXI	39
XV	66	XXXII	14
XVI	81	XXXIII	20
		Unclassified	184
Total Positive Typings			5436
Total Negative Results			6574
Total Laboratory Exam.			12010

At the present time (July 1, 1940), 175 approved pneumonia typing laboratories are functioning and serum and sulfapyridine are being distributed from 27 centers throughout the State.

Anti-serum or sulfapyridine or both was provided by the State Department of Public Health on requests from physicians for approximately 5,200 pneumonia patients between July 1, 1939 and July 1, 1940. Available for this paper are complete reports on 4,158 of these treated cases which show a total mortality of 7.7%. (Mortality figures are shown according to type in Table III.) Most common in this series is type I with 730 cases and a mortality of 5.3%. Type III ranks second with 592 cases and a mortality of 12.1%. The lowest mortality of any group in this series involving as many as 100 patients was observed in type XIV with 168 cases and 5 deaths, a matter of 2.9%.

Since sulfapyridine was made available, only 270 pneumonia patients among those treated with therapeutics provided by the State Department of Public Health have been treated with antipneumococcic serum alone. (See Table 4.) Among these 270 there were 39 deaths, a mortality of 14.4%. Sulfapyridine alone was given to 1,573 patients. Among these there were 51 deaths or 3.2%. Of the 2,315 patients who received both serum and sulfapyridine there were 236 deaths or 10.1%.

Table 3. Specifically Treated Cases Serum and Sulfapyridine July 1, 1939 to July 1, 1940

Type	No. Cases	No. Deaths	% Deaths
I	730	39	5.3
II	367	36	9.8
III	592	72	12.1
IV	172	10	5.8
V	172	10	5.8
VI	190	8	4.2
VII	315	18	5.7
VIII	264	18	6.7
IX	70	6	7.1
X	45	10	22.2
XI	64	7	11.1
XII	33	0	0.0
XIII	48	5	10.4
XIV	168	5	2.9
XV	44	4	9.0
XIX	149	16	10.0
XVI & over	735	62	8.4
TOTAL	4158	326	7.7

Table 4. Specifically Treated Cases July 1, 1939 to July 1, 1940

	SERUM			SULFAPYRIDINE			SERUM & SULFAPYRIDINE		
Type	Recoveries	Deaths	%	Recoveries	Deaths	%	Recoveries	Deaths	%
1	49	4	7.5	178	5	2.7	464	30	6.4
2	22	5	18.5	113	11	8.8	196	20	9.2
3	20	3	13.0	151	7	4.4	349	62	15.0
4	16	2	11.1	63	0	0.0	83	8	8.7
5	18	1	5.2	63	0	0.0	81	9	10.0
6	8	2	20.0	112	0	0.0	62	6	8.8
7	19	1	5.0	116	3	2.5	162	14	7.9
8	19	4	17.3	68	3	4.2	159	11	6.4
9	3	1	25.0	32	1	3.0	29	4	12.1
10	3	0	0.0	11	3	21.4	21	7	25.0
11	3	0	0.0	22	3	12.0	32	4	11.1
12	1	0	0.0	18	0	0.0	14	0	0.0
13	2	1	33.3	26	0	0.0	15	4	21.0
14	11	1	8.3	93	3	3.1	59	1	1.6
15	0	0	0.0	27	1	3.5	13	3	18.7
19	7	4	36.3	58	1	1.6	68	11	13.9
16 & over	30	10	25.0	371	10	2.6	272	42	13.3
TOTAL	231	39	14.4	1522	51	3.2	2079	236	10.1

It is doubtful whether the last two mortality figures give an entirely valid basis on which to draw conclusions. At present it is not known whether the combination of serum and sulfapyridine was given to unselected cases or only to those most severely ill. In other words, these figures may be critically altered when the case analyses answer the following questions: 1. Which age groups received both serum and sulfapyrdine? 2. If sulfapyridine failed to produce the desired results was serum used as the final resort? 3. How ill and what complications were present in patients receiving combination therapy? All these factors must be considered before drawing any conclusions from the figures as they appear in this preliminary report.

From July 1939 to May 1940 of the 1,147 typed cases of pneumonia that received sulfapyridine alone, a comparative mortality study was made according to the amount of drug used in the treatment of individual patients. (See Table 5.) Unfortunately, not enough blood sulfapyridine studies were made by the general practitioners to be of any statistical value. It is interesting to note, however, that even with theoretically inadequate amounts of sulfapyridine the gross mortality was less than 5%.

Table 5

Gms. per case	No. Cases	Deaths	Per cent.
0 - 4	139	6	4.3
5 - 9	315	14	4.4
10 - 15	233	4	1.7
16 - 20	152	8	5.2
21 - 25	104	2	1.8
26 & over	140	2	1.4
Total	1083	36	3.3

It should be noted here that among 91 patients in whom pneumococci were present but could not be typed, there were 13 deaths or fatality rate of 14.2%. All of these patients received sulfapyridine. This seems to be a strong argument in favor of the importance of establishing the type for specific etiological diagnosis.

Regardless of the therapy used, the mortality figures in pneumonia patients over 60 years of age still remain high. For example, in 66 type I cases over 60 years of age there were 15 deaths or a mortality of 23.0%. In 225 cases of type III over 60 years of age there were 48 deaths or a 21.3% mortality. (See Tables 6 and 7.) These figures include all pneumonias, both lobar and broncho, in which pneumococci were typed from the sputum.

Table 6. Type I. 730 Specifically Treated Cases — 39 Deaths — 5.3%

Age	No. Cases	Died	Recvd.	% Deaths
0 - 2	15	0	15	0.0
2 - 19	217	2	215	0.9
20 - 39	254	5	249	1.9
40 - 59	178	17	161	9.5
60 & over	66	15	51	23.0
TOTAL	730	39	691	5.3

Age	Serum Only		Sulfapyridine Only		Serum & Sulfapyridine	
	R	D	R	D	R	D
0 - 2	2	0	5	0	8	0
2 - 19	18	0	72	0	125	2
20 - 39	16	0	52	0	181	5
40 - 59	8	3	41	2	112	12
60 & over	5	1	8	3	38	11
TOTAL	49	4	178	5	464	30
%	7.5		2.7		6.4	

Table 7. Type 3. 592 Specifically Treated Cases — 72 Deaths — 12.1%

Age	No. Cases	Died	Recvd.	% Deaths
0 - 2	16	1	15	6.2
2 - 19	52	0	52	0.0
20 - 39	76	1	75	1.3
40 - 59	223	22	201	9.8
60 & over	225	48	177	21.3
TOTAL	592	72	520	12.1

Age	Serum Only		Sulfapyridine Only		Serum & Sulfapyridine	
	R	D	R	D	R	D
0 - 2	1	0	8	0	6	1
2 - 19	0	0	24	0	29	0
20 - 39	3	0	24	0	48	1
40 - 59	6	0	43	2	151	21
60 & over	10	3	52	5	115	39
TOTAL	20	3	151	7	349	62
%	13.0		4.4		15.0	

It must be stressed here that the average fatality rate of 7.7% represents the experience only of pneumonia patients who were treated with serum and sulfapyridine distributed free by the State Department of Public Health. This rate applied by no means to the general fatality rate from pneumonia of all kinds in Illinois. However, even these latter statistics reveal a general downward trend in both the death and fatality rates from pneumonia. For example, in the first quarter of 1939 (January 1 through March 31) 6,198 pneumonia cases of all forms were reported with 2,030 deaths. During the first quarter of 1940 there were reported 6,759 pneumonia cases of all forms with 1,489 deaths. In other words, although 300 more pneumonia cases were reported there were 500 fewer deaths, a significant drop in the general mortality from pneumonia as well as in the fatality rate. Of course virulency of the organism in the two periods is a factor to be considered.

It is realized that it will take many years of concentrated effort to reduce the general fatality rate from pneumonia, to, say 10%. It is felt, however, that through the pneumonia control

program which has stepped up substantially the employment of the potent therapeutic weapons now available, a noteworthy advancement in the right direction has been made. With the modern methods of pneumonia control which are being further developed almost daily, a goal of 10% fatality or even less, is not too much to expect in the not too far distant future.

SUMMARY

1. During the first six months — January through June, 1939 — of the Illinois Pneumonia Control Program, 1,016 patients, diagnosed for type, were treated with antipneumococcic horse serum distributed free by the State Department of Public Health. The mortality in this group was 14.1%.

2. Both sulfapyridine and antipneumococcic rabbit serum for all types have been distributed since the beginning of 1940. The number of typings performed during the second season of the pneumonia control program was five times greater than in the first. In the second season, July 1939 — May 1940, a total of 5,436 patients were treated with therapeutics provided by the State Department of Public Health. Among these, 4,158 on whom detailed reports are available for this paper, 326 died, a mortality of 7.7%.

3. Although this preliminary study reveals that the lowest mortality occurred among patients who received sulfapyridine alone, other factors — such as severity of the pneumonia in which combination therapy was used, or delay in the use of serum if sulfapyridine failed to give the proper response, — must be considered in evaluating the figures.

4. The mortality figures on patients receiving serum only were slightly lower in the second than in the first season.

5. Very little change in pneumonia fatality rates has been noticed in the age group of 60 years and over, regardless of the kind of therapy used.

6. The mortality from pneumonia in general and the general case fatality rate was significantly lower in Illinois during the first quarter of 1940 than in the first quarter of 1939. Although 300 more cases were reported during the second season, there were 500 less deaths.

7. These data indicate that pneumonia death rates can be controlled, and that if therapeutic methods continue to be as effective in the future as revealed by this study, a gross mortality rate of 10% or less might be expected within a few years.

CONCLUSIONS

A state-wide pneumonia control program which includes the free distribution of antipneumococcic serum of all types along with controlled amounts of sulfapyridine, has proved to be a practical, efficacious, and safe means of lowering mortality from pneumonia in Illinois. Both of these therapeutic agents seem to be easily and well handled by the general practitioner in his treatment of pneumonia patients. It is increasingly evident that a careful etiological and laboratory diagnosis of each pneumonia patient should be made in addition to a careful clinical consideration of the severity of the illness of the patient. Only after the strictest attention has been given to these two factors, can appropriate treatment be instituted.

PROSTATIC ELECTRORESECTION; VIEWS ON PROCEDURES AND URINARY INFECTIONS

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AND
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The subject of urinary infection and stasis embraces a tremendous literature, all of which is characterized by various episodes of great activity in scientific and experimental investigation.

The monumental research efforts of certain groups of biochemists, bacteriologists and physiologists through years of intensive study, have given us a dependable bacteriological classification, which in its practical application to infection is noteworthy.

Our former conceptions and individual reactions on urinary infections and sepsis appears quite primitive in the light of modern scientific achievement, and while many earlier theories have been discarded as untenable, yet all have had a definite part in furthering a crystalization of ideas on bacteria and their relations to infection. The medical profession in general, and experimental scientists more specifically, I believe, are to be complimented for an admirable accomplishment in this important field of medicine.

The obvious awakening of urologists in the subject of bacteriology, electrolytic requirements,

fluid exchange and preoperative vaccination against impending infection has materially aided in the advance. The knowledge of dangers attending trauma, aseptic precautions in resectional management and complete resection have reduced urosepsis and mortality to a minimum.

SPECIFIC VIEWS ON PROCEDURES

The candidate intended for resection, not given the advantages of a meticulous bacteriological study of the urine and prostatic secretions may be in a sad plight; it appears to be the better part of valor to be forwarned, assume no chances, and investigate.

We are deeply concerned with the problem of preoperative preparation prior to resection and although in this treatise we are concerned chiefly with urosepsis and pyuria, yet a thorough knowledge of existing modern tendencies and the proper application of sound surgical principles are vital, if resectional success is to be achieved.

Doubtless one of our most sterling urological heritages of the past decade has been the tremendous reduction in prostatic mortality; this has resulted from an accumulation and the utilization of the principles of preoperative preparation. I feel that there is a growing tendency among urologists to accept with small concern the foregoing important observations in the management of prostatism, transurethrally. The hazards concomitant with resection are manifold and not uncommonly due to flagrant errors in preoperative knowledge, which are avoidable through the medium of intelligent study. Hemorrhage, urosepsis, ascending infection, shock and cardiorenal vascular failure are not infrequently noted, and generally the answer to a vague conception of the uncertainties surrounding resectional procedures.

The almost universal acceptance and general interest in this modern method of prostatic management is sufficient proof of the splendid adaptability to all phases of prostatic hyperplasia.

Considering the fact that the mean age of prostatism is notably increasing, let us be evercautious in protecting this excellent procedure against an overambitious urological commercialism and an indiscriminate general application.

The onward march of resection from its inception to our present state of marked precision is a noteworthy accomplishment, unparalleled in the annals of urological history. Well do we remember our earlier trials in resectionally combating the tremendous problems of prostatic obstruction and the adverse criticism so prevalent at that period. Statistical data and personal experiences virtually stampeded all urological as-

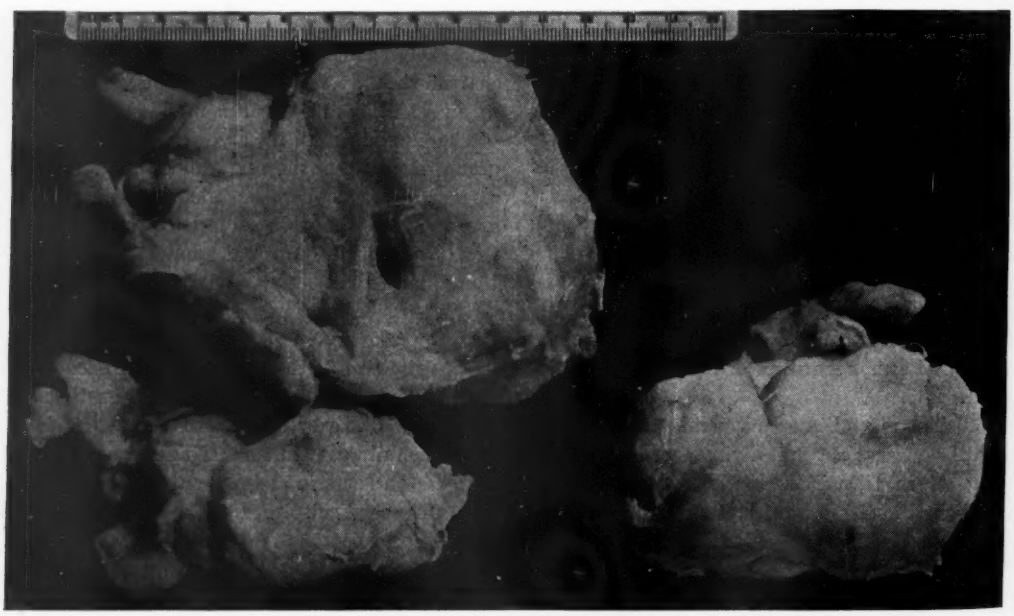

Figure 1. Grossly hypertrophied prostates are more satisfactorily managed suprapubically. Weight 410 grams

semblies and specialistic publications. The indiscriminate use of such time honored terms as suprapubic or perineal postatectomy were hastily banished from our nomenclature; as new surgical procedures must be adopted if one intends to maintain his urological standing. The foregoing observations are not submitted in the spirit of criticism, but merely to call to mind the well known fact that any departure from orthodox modes requires an extraordinary appeal and an abundance of clinical and surgical substantiation.

Former disastrous overwhelming tragedies of resectional procedures as streptococci septicemia, urinary extravasation, perivesicle and pelvic cellulitis are now rare entities. Retroperitoneal suppuration and perinephritic abscess, uremic death due to renal insufficiency are now avoidable sequelae in this period of endoscopic exactitude.

It appears, that after a thorough résumé of the literature and considerable correspondence, minute unanimity of thought exists among urologists as to the same extent to which resection should be instituted, except in certain well defined cases.

I have ever been of the opinion that unequivocal preemptory classification of suitable cases, indications and counterindications are without value and unimpressive, as success depends in a large measure on experience, judgment and a complete evaluation of existing urological findings.

Personally, I believe that this naturally debatable issue will be endlessly before us, and indeed not unlike the fatiguing controversy so long akin between suprapubic and perineal prostatectomy. But not withstanding, in transurethral surgery we are confronted with a procedure of exacting precision and shocking vicissitudes, and as Cabot has well said, in effect, "For the occasional operator open surgery is a safer attack."

Urologists who have been alert in every new phase of endoscopic refinement and advance, who have a practical knowledge of the intricacies of blood and lymphatic supply, and who possess a natural aptitude for complex and exacting instrumentation will ultimately achieve success.

In accord with the foregoing general reactions on personal judgment, instrumental experience and so forth, case selection and end-results will depend upon a consideration of:

1. An exacting evaluation of bladder neck pathology.
2. Cardiorenal vascular reserve.
3. Blood values and urine constituents.
4. Bacteriological characteristics of urinary

Figure 2. Large intravesicle protrusions with accessory nodular enlargements are with difficulty removed transurethrally.
Weight 418 grams

invasion and infection.

5. Intravenous pyeloureterograms and cystograms as a reasonably reliable aid in ascertaining renal function and bladder morbidity.
6. Electrocardiograms.
7. Urethral fibrosis or occlusion.
8. The degree of urosepsis and pyuria.

The cases of resection following suprapubic cystotomy for stone, tumors, diverticulum, and large intravesicle hypertrophy are commonly seen by us, and while we generally reserve the grossly enlarged intravesicle protrusion for enucleature, yet notwithstanding, splendid results have accrued in resection following open surgery, due to improved drainage, relief of stasis, infection and prostatic dehydration.

The tremendously enlarged intravesicle glands have presented many formidable problems for us and frankly our results have not always been encouraging. Multiple resection productive of urosepsis and pyuria due to prostatic remnants, injury to the trigonal muscle with resultant trigonal sclerosis is not uncommon in these cases. Functional damage to the ureteral orifices with secondary urethral atony and hydronephrosis, urethral fibrosis due to trauma, have been reported and have been seen by us in certain instances.

Generally considered, the advantages of endoscopic resection are impressed upon us in direct ratio with our experiences as resectionists. We have noted with enthusiasm the practically universal indorsement of resection to the almost complete exclusion of open surgery with but few well defined exceptions. The many advantages immeasurably outweigh the disadvantages; surgical shock, hemorrhage, cardiorenal failure and embolism are formidable factors and should be carefully considered in all pre and postoperative investigations. The relative absence of shock and the decreasing mortality rate (1½ to 4 per cent) are outstanding in resected cases, and when one considers that a vast majority of our prostatics are within the last dregs of the cup, every effort should be furthered to reduce

Figure 3. Massive intraurethral, intravesicle and subtrigonal intrusions severely complicate transurethral surgery.
Weight 392 grams

hospital domicile and eliminate the hazards formerly attending this distressing malady.

I shall merely mention resection as a prophylactic measure to vigorously condemn it. The following statistical review of our own cases uncovered seventeen interesting cases, all of which had been previously operated upon elsewhere and had not arrived at the age of forty-five years. The indications being as follows: four cases were resected for recurrent epididymo-orchitis; six cases for posterior urethral fibrosis, gonorrheal in origin; and the remaining for unrecognized bladder neck pathology, probably recurrent pyelonephritis with persistent pyuria. The foregoing recital rather smacks of ambitious publicity seeking commercialism or incompetency.

I hold no brief for the conscientious discriminate application of endoscopic methods in early adenofibromatous hyperplasia. However, in computing the incidences of this progressively increasing group, careful discretion in diagnosis is paramount, as many are of a mild inflammatory nature, successfully managed by well known palliative measures.

Doubtless, we as resectionists have witnessed the wave of advance and temporary periods of discouragement in endoscopic resection due to, mainly, an acknowledgment of personal limitations, and an inherent desire for perfection, in order to obtain the following necessary objectives; first, a complete restoration of bladder neck function with a minimum of trauma; second, thorough and complete removal of all obstructive tissue; third, prevention of recurrence; fourth, avoid complications; and, finally, insurance of safety in prostatic surgery.

The aforesaid outstanding objectives are not easy of accomplishment, and I feel that much of our present difficulties are due to a lack of knowledge of the anatomy and physiology of the bladder sphincters and prostatic urethra. The margin of safety decreases posteriorly to the internal sphincter due to the proximity of the trigone and ureteral orifices. Resectional removal of subtrigonal protrusions, in our experience, has produced unfortunate happenings due to fibrotic contractions, subtrigonal infection and irreparable functional disturbances. The external sphincter, voluntary in action, and the verumontanum externally, are to be judiciously avoided due to the possibility of excessive hemorrhage and postoperative dribbling.

The basis of all success in this department depends solely on our recognition and adherence to the basic laws of anatomy and physiology; we have long been cognizant of the fact that resection is not an easy way out of a difficult problem. Maximum results plus minimum knowledge does not dwell with resection.

URINARY INFECTIONS INCIDENT WITH RESECTION

Urinary infection associated with resectional cases shall be discussed under two general captions: First, the generally accepted mechanical genesis as a predisposing factor; second, the recognition and management of bacterial infection and invasion.

Concerning prostatic surgery in retrospection, regardless of surgical approach, hemorrhage, sepsis and uremia have been the problems of concern, and sepsis, I believe, the chief offender.

In contrast, urosepsis and pyuria in resection presents an entirely different picture than that seen in open surgery due to a failure of adequate drainage, instrumental difficulties and stasis. Hence the importance of a clear conception of instrumental trauma as a predisposing factor in urosepsis, pyuria, pyelonephritis and uremia.

Sepsis a co-chairman in prostatectomy is definitely less formidable in modern resection, due to improved technique and a practical working knowledge of bacteriology and preoperative understanding.

Instrumental causes of urosepsis, quite prevalent in resectional reports, I feel are generally grossly exaggerated. The dire results of indwelling catheters and the numerous reports of stricture formation produce excellent controversial subjects for the literature, but in our experience, is more myth than actuality. In a large experience with endoscopic resection, only in rare instances was witnessed a definite infection of consequence due to indwelling catheters, or strictures resulting from so-called prolonged manipulation; frequent lubrication of the sheath and the use of small indwelling catheters, if you must use retention catheters, will obviate these potentialities.

Postoperatively the use of hemostatic or balloon catheters, while a necessary evil, nevertheless, are unsound surgically; pressure necrosis

plus infection presents a potent cause for bacterial invasion, pyelonephritis and renal insufficiency. All senile hyperplasia, whether adenomatous or fibrous, are infected and a fertile field for bacterial incubation, ill equipped to combat infection and sepsis. Dependable hemostasis during the resection, in addition to mental security, will lessen periods of postoperative drainage, a cause of urinary infection.

Cysto-urethroscopy prior to resection is a matter of routine in our work and its value cannot be overestimated. The urethra is thereby easily calibrated. Moreover, strictures, fibrosis, inbeded urethral calculi and unusual urethral deformities are noted and carefully managed; all of which are hinderances to a perfect resectional result.

Postoperative urethral stricture in most instances was of long standing, unrecognized and a common source of infection unless preoperatively managed. Excessive postoperative urethral dilatation is perilous due to the ease of bacterial invasion resulting in periurethral infiltration, vas deferenitis and epididymo-orchitis. We are convinced that urethral strictures are rather an uncommon complication, or an aftermath of endoscopic procedures; their presence, however, should be investigated before and not after surgery.

Considering the fact that urosepsis and pyuria are important burdens in resection every effort should be employed in their eradication. We have noticed a marked diminution in urosepsis since instituting a rigid course of aseptic measures, before, during and following the procedure. The preliminary introduction of catheters and cystoscopy is given every possible aseptic consideration. The patient is prepared for these early investigations with every aseptic precaution, so that foreign infection will not be added to our already infected host. The newer drainage outfits with heat control, rubber tubing, byways, reservoir bottles and so forth are simple of sterilization. Utilization of these modern systems of irrigations and drainages have been suitable for our cause in diminishing infection. Postresectional drainage is an extremely important factor in resectional results, and every precaution is necessary in order to render it aseptic.

The removal of clots and bits of tissue which so commonly interferes with drainage becomes a real issue in many cases, and is difficult to overcome in our defense against bacterial introduction. Sterile syringes, evacuators, gloves and sterile drapes are imperative. Competent surgical assistance, and not inexperienced interns with small knowledge of urethral morbidity and mortality, should be available when the occasion merits. The value of a well trained surgical team cannot be overestimated, and in our experience has been the medium through which urosepsis and bladder overdistention have been avoided postoperatively.

Doubtless many of our perplexities in drainage are attributed to faulty insertion of the catheter following resection. The drainage catheter should enter the cavity of the bladder with perfect freedom and not necessitate the use of stilettes or sounds. Unnecessary manipulations, at this period, are dangerous due to the possibility of hemorrhage, and the trauma attending often results in infection. In a thoroughly performed resection, drainage catheters enter without obstruction and a free flow of irrigation is assured.

Hemorrhage, dysuria and incontinence are major factors of concern following resection, and in our experience postoperative bleeding, present and remote, is frequently a troublesome handicap. The necessary absorption of clots is fraught with dangers due to the inevitable occurrence of infection, and in severe cases obstructive changes in the ureters and kidneys. Excessive and prolonged attempts of coagulation in this limited area of great vascularity, results in postoperative hemorrhage due to sloughing, and further, infection due to difficulties attending adequate drainage. The prostate and adnexa in most cases are virtually cesspools of latent infection, and the ease with which systemic infection and urosepsis are produced is often startling — however, not without understanding. The excessive coagulation of tissue and sealing-in of infection is generally followed by bacterial proliferation, vascular and lymphatic absorption and finally varying degrees of systemic involvement. Accordingly our aim and objective is complete removal of all obstructive tissue with a minimum of deep coagulation.

In those very rare cases in which cystotomy was necessary for the control of hemorrhage, we were soon to learn the inadvisability of excessive

use of the coagulation current. Large areas of blanched necrotic tissue, highly favorable for the development of secondary hemorrhage and sepsis, were noted, also the retention of secretions and a patient in severe shock. Hemorrhage, during resection and postoperatively, is still a major complication and while not as prevalent as formerly, is only too frequently a mighty resectional deterrent.

A more accurate knowledge of the ramifications of the chief vascular supply, namely, the inferior vesicle, middle hemorrhoidal, internal pudendal, and urethral vessels, will greatly assist one in the control of bleeding. The depth of tissue removal is a prime factor in obviating the necessity of deep coagulation with its secondary evils, infection and hemorrhage.

The prostatic bed is highly vascular, being virtually surrounded by retroprostatic lymph nodes and vessels, which terminate in the hypogastric and sacral glands. The prostate then lies in a rich lymphatic plexis, all of which render this area susceptible to severe uncontrollable hemorrhage, if inadvertently sectioned or deeply coagulated. Continued experience with resection soon teaches one to differentiate between the prostate and capsule, and fibromatous tissue from adenomatous tissue. With this knowledge, hemorrhage ceases to become a formidable hazard and resection is facilitated with gratifying security.

Upper urinary tract morbidity and infection due to mechanical failures have been seen by all resectionists of experience, and the most prevalent causes, I would classify as follows:

1. Distortion and fibrosis of the internal sphincter.
2. Subtrigonal infection, sclerosis and loss of function.
3. Occlusion, atony and deformity of ureteral orfices due to injury and contraction.
4. Excessive trauma, due to prolonged instrumentation and the failure of preoperative urethral calibration and inspection.
5. Temporary and remote incontinence due to injury of the external sphincter.
6. Rendundant remnants of incomplete resection.

The foregoing tabulations are important occurrences in resectional procedures, productive of serious complications, some of which are irreparable and others a prelude to pyelonephritis, uremia and death.

Devitalization, infarction, and sloughing, the results of incomplete removal of resected tissue are the chief causes of persistent urosepsis and prolonged pyuria. The tissue resected or coagulated must be removed, otherwise, dysuria, frequency and cloudy urine will persist indefinitely.

Former experience with sulfanilimide, mandelic acid, acidification and bacterial lysis and stasis clearly demonstrate their impotency in the presence of mechanical failure attending the removal of obstructive tissue. Chemotherapy proved to be merely a temporary relief, with a prompt reappearance of symptoms as soon as discontinued. We have little faith in urinary antiseptics in the presence of obstructive morbidity.

The adenomatous mass of prostatic tissue is supplied chiefly by the urethral vessels, branches of the internal pudendal, which increase numerically in direct proportion with the prostatic hypertrophy and encroachment — hence, the more advanced the enlargement the more formidable the factors of hemorrhage and sepsis. These vessels ramify from within outward through the substance of the gland and are necessarily cut and sealed during resection. In extensive intraurethral and intravesicle protrusions, wide areas of tissue removal and coagulation are a necessity to obtain satisfactory functional results and to avoid postoperative sepsis.

The monstrous intravesicle enlargements, with increased vascularity and our inability to completely visualize the inferior aspect transurethrally, are of necessity, managed suprapubically; suprapubic drainage and dehydration, preliminary to resection, not withstanding.

Our former concept on the hypothesis of infection in all vesicle hyperplasia has been clearly confirmed since a more general application of resection in this field. The liberation of pus pockets during the removal of tissue has been commonly observed by all resectionists. The cutting loop in its excursion through the infected prostatic tissue causes a virtual spouting of a tooth paste-like column of thick pus. Digital pressure per rectum always facilitates the appearance of this interesting phenomenon. The common occurrence of generalized prostatic infection has been a perplexing finding and has impressed us more definitely with the prudence of preoperative elimination of all foci of infection, whenever possible.

Preoperatively, the universal use of chemotherapy, acidification, and bladder decompression, to reduce prostatic engorgement and reduce renal and ureteral stasis, are of value in extensively infected cases. Also, essentially normal blood values should be attained; electro-cardiography and excretion pyelography, as a fairly reasonable estimate of renal function, are routine.

THE INTERPRETATION AND MANAGEMENT OF BACTERIAL INVASION IN RESECTION

Urinary tract infection considered from a general adaptable viewpoint, naturally classifies itself into:

First, urogenous.

Second, ascending and hematogenous.

Urogenous infection antedates the ascending types and is due to contamination and instrumentation, be it either unnecessary catheterization or mechanical failures during resection. Urosepsis in varying degrees of intensity is a frequent complication and of small consequence unless capillaries and lymphatics are invaded, resulting in marked changes, interferences with urinary output, and ascending infection.

Pyuria, a visible expression of pyelonephritis resulting from infection in the prostatic bed, is the cause of more apprehension on the part of the resectionist than the patient. That this complication is rapidly becoming an infrequent occurrence in the experience of most operators is due to a more exact knowledge of the cause or causes.

We have noted in the prolonged cases of cloudy urine, postoperatively, in which sulfanilamide, mandelic acid and acidification were unsuccessful, a cystoscopic examination would usually reveal overhanging infected tissue, a distorted internal sphincter, or a retention diverticulum.

Those cases of pyuria due to incomplete resection in the adenomatous types, have shown the most gratifying results, following resection of prostatic tissue plus the generous use of chemotherapeutic agents for urinary sterilization. Prostatic cases with an abundance of fibrous tissue appear to produce a minimum of postresectional infection, and our early experiences have established the fact, as far as we are concerned, that a transurethral prostatectomy in these cases was not always necessary. We have seen no logical reasons for altering our former views in this respect.

The massive intravesicle cases due to extensive resection and coagulation have produced most postresectional urosepsis and pyuria. This not always results from faulty technique, but is due to long standing upper urinary tract morbidity, bladder deformity and chronic urethral fibrosis.

We feel that these old prostatics with advanced changes in the renal architecture, with damage to the secretory excretory functions, should be given the advantage of careful study and hence improve their status prior to operation. Ascending infection in these cases inevitably results in serious and often fatal termination. Resection in this group of hazardous cases, with little cardiorenal vascular reserve, mounting blood values and renal infection, has been a distinct advance in prostatic management. We have noted that a 75 per cent improvement in this class is not infrequently superior to death when open surgery is considered.

CONCERNING SPECIFIC BACTERIAL ENTITIES

With the appearance of sulfanilamide, mandelic acid and acidification it has become an absolute necessity for the urologist to be more bacterilogically conscious than ever before. We have further noted that due to the gratifying results obtained from the use of these antiseptics, bacterial study has become an interesting research for even the busy urological clinician. The case scheduled for urological study has not had a complete check-up, until a dependable laboratory report of the causative organism or organisms is correctly obtained. Nor are the procedures in general use for the determination of bacteria too extensive for routine office procedures. All are familiar with the necessity of sterile precautions in obtaining urine samples for bacteriological study. The urine is centrifuged and the sediment examined for pus, red blood cells and other pathological elements. The cover slip is then removed and the sediment dried, fixed and gram stain used. Bacteria, if present, will be either rod shaped — the bacili, or round — the cocci. They can be only gram-negative or gram-positive.

Approximately 75 per cent of urinary tract infections are caused by the gram-negative bacillus, Escherichia coli. Other gram-negative bacilli which cannot be distinguished from bacillus

coli by the gram stain are Aerobacter aerogenes and pseudomonas and proteus genera. With the exception of the proteus group the response of the gram-negative bacilli to mandelic acid therapy is quite satisfactory. If, after a few days of acid therapy, the urine still remains alkaline or the ammoniacal odor of this urea splitting group is detected, proteus is present. Naturally cultural methods will differentiate them. However, this is seldom used, as it is time consuming and more elaborate in procedure.

About 20 per cent of the urinary tract infections are caused by cocci, and these, except for the gonococcus, are nearly all gram-negative. By examining the gram smear it is easily determined whether the organism is a staphylococcus occurring in groups, or streptococcus in chains. The micrococcus is also obvious on examination. The most common coccal form found in urinary infections is streptococcus fecalis and it is usually a secondary invader found in the presence of an indwelling catheter. The streptococcus fecalis is gram-positive and, besides occurring in chains, has a distinctive elliptical shape which makes its diagnosis easy. To differentiate them further by cultural methods is again difficult and usually unnecessary. The cocci, with the exception of streptococcus fecalis, respond nicely to sulfanilamide; this must be treated with mandelic acid. The bacilli are treated about equally as well with sulfanilamide or mandelic acid with one big exception, that being the proteus group which responds only to sulfanilamide.

Where there is an accompaning or associated prostatitis, sulfanilamide, since it seems to infiltrate the tissues of the prostate, is the drug of choice rather than the topical urinary antiseptic such as mandelic acid. Also in impaired renal function mandelic acid may not be excreted in sufficient concentration by the kidneys to be of benefit in sterilizing the urine. Here again sulfanilamide is indicated.

RESECTIONAL DEATHS

We have found it advisable, in discussing the relative merits of resection and prostatectomy, to be very guarded in our prognostications. Patients must not be lulled into the sense of imaginary security that resection is a minimum procedure, and due to low mortality, disturbing factors never occur. Resectional deaths are infinitely more difficult to explain, especially in that class of early prostatics whose symptomatology is not necessarily urgent and whose general physical findings are favorable. In our own experience, wholly unsuspected deaths, due to pulmonary embolism or coronary thrombosis in patients with excellent preoperative findings, has taught us the wisdom of caution in preliminary surgical discussions.

In discussing the subject of resectional fatalities with pathologists, and a result of autopsy reviews in these cases, it appears that bronchopneumonia is a very common etiology. The advanced age, debilitated state, frequency of coronary disease render broncho-pneumonia a logical conclusion.

Next in order of frenquency is urinary sepsis, i. e., cystitis with or without ascending pyelitis or pyelonephritis. In a majority of these instances there is usually strong evidence that at least a cystitis with retention diverticula, stone, and so forth were present prior to surgery. In some cases, however, when pyelonephritis without a trace of cystitis was found, the conclusion was obvious that the infection had advanced from the operative site along the ureteral lymph vessels to the kidney. Such a retrograde pathway of spread is not infrequent; it is commonly seen in bladder carcinoma.

Cellulitis of the urinary bladder with an associated spreading cellulitis of pelvic floor and facia was formerly a frequent cause of septic death. The process either dissected downward into the ischiorectal fossa and perineum or ascended retroperitoneally between the peritoneum and transversalis fascia, finally terminating in retrorenal suppuration, abscess and death.

An interesting comment on the above was that in practically all instances a pre-existing parenchymatous prostatitis with multiple abscess was reported.

Hemorrhage, per se, as a cause of fatalities in modern resection is quite infrequent. However, the instrumental trauma instituted in relieving the overdistended bladder is often productive of urosepsis and finally general septicemia.

SUMMARY

1. The authors have considered the subject of urinary infection and resectional procedures from a broad and general viewpoint.
2. Resection is the procedure of choice in the management of senile hyperplasia.

3. Massive intravesicle protrusions are reserved for open surgery. However, one's aptitude and experience will determine the choice in these cases.
4. A tangible working review of bacteriological studies and their management was considered, and conclusion with notes on resectional mortality.

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THE SPECIFIC TREATMENT OF ANEMIA WITH LIVER AND IRON

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All the red cells in the body together make up an organ just as definte as the liver or the brain. This organ, designated the erythron by Boycott,[1] is the largest organ in the body. It differs from other organs in numerous ways. It is constantly in motion; the component cells are not nucleated, and are not united as the cells of other organs are; each cell functions as an individual unit. The purpose of the red cell, and thus of the erythron, is to provide a container for hemoglobin by which oxygen is carried from lungs to tissues. This is a fundamental function in the body, since the life of every cell depends on an adequate and constant supply of oxygen.

The erythron of a normal man has a volume of about 2,250 cc., contains nearly 800 grams of hemoglobin, and is made up of about 25 trillion red cells. A red cell functions like a cup on an endless chain conveyor, taking up oxygen in the lungs and releasing it in the tissues. While circulating the red cell is subjected to much mechanical and chemical trauma. An average cell wears out in about thirty days. During this time it makes about 60,000 round-trips from lungs to tissues. Thus, the erythron is continually changing and has to be completely replaced every month. To maintain the red cells at the normal level, about one trillion red cells containing 30 grams of hemoglobin must be formed daily. The erythrocyte formation proceeds at the rate of nearly one billion cells per minute.

Erythrocytes, after they have functioned on an average of a month, show the effects of the mechanical and chemical wear and are taken out of the circulation by the retticulo-endothelial cells of the spleen. The cell stroma is completely broken up. The hemoglobin released when the cell breaks up does not return to the blood as such but is disintegrated by the reticulo-endothelial cells. The globin-hematin combination in the hemoglobin molecule is split up, the iron in the hematin fraction is set free, and bilirubin is formed. Bile pigment is the sole recognizable end-product of erythrocyte destruction.

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Since red cells are formed at a rapid rate, a large amount of building materials such as water, mineral salts, protein, fat, and carbohydrates are required to make them, as all these are contained in the cell. Such nonspecific materials are those required for making all cells. Two specific substances are necessary also; one enters into the formation of stroma, the other is required to make hemoglobin. The substance necessary for normal stroma formation results from the action of a specific secretion of the gastric mucosa (the intrinsic factor of Castle) on some element in the food (the extrinsic factor of Castle). This substance is supplied by liver and liver substitutes. It has the property of specifically maturing the erythrocyte or putting a finishing touch on it in preparation for emergence for the bone marrow. This specific principle has been designated the erythrocyte-maturing factor (EMF)[2].

As the stroma of the red cell is formed by nonspecific components and the specific erythrocyte-maturing factor, hemoglobin is deposited in the stroma to saturation which is one-third the total mass. The hemoglobin is made by the reticulo-endothelial cells of the bone marrow. The porphyrin nucleus needed for building the hemoglobin molecule is abundant. However, hemoglobin cannot be made without iron. This specific element is often deficient because the reserve store in the body is very small. To replace the 30 grams of hemoglobin normally destroyed each day, about 100 mg. of iron are required. The total amount of iron in the body is only about 4 gm. and nearly 3 gm. of this is in hemoglobin. Only 85 to 90 per cent of the iron set free from the hemoglobin broken down each day is used again, so 10 to 15 mg. must be supplied each day to make up the deficit. The diet seldom contains much iron so if there is a deficient intake of iron-containing foods a deficiency develops. When external hemorrhage occurs the most important loss is in iron; with internal hemorrhage the iron is conserved. The hemoglobin content of the blood falls rapidly if the supply of iron is inadequate.

The marrow in which the cells are being formed is thought of as a grist mill which is supplied by three hoppers. Two hoppers supply the specific substances, iron and the erythrocyte-maturing factor (EMF) of liver and liver substitutes. The third hopper supplies the nonspecific elements of the cells. The erythrocyte-maturing factor and the nonspecific materials are absorbed from the gastro-intestinal tract; iron is partly supplied in the same manner and in part by the iron set free as hemoglobin is destroyed.

A number of factors influence the needs for and the supply of the specific building materials. With growth, the total hemoglobin of the body increases because the blood constitutes a fixed fraction (about 1/13th) of the body weight. If a normal man has 800 grams of hemoglobin, a child one-half his weight has only 400 grams of hemoglobin. As the total hemoglobin increases with growth, the store of iron in the body must increase proportionately. This added need may be difficult to obtain from the food so must be supplied as medication. Menstruation means a constant loss of iron which must be replaced. Pregnancy and lactation also deplete the store of iron of the mother.

Besides the physiologic factors of growth, menstruation, and pregnancy and lactation on the maintenance of a normal supply of the specific elements, the formation of stroma and hemoglobin is influenced by other conditions. Cell-building materials are absorbed from the gastro-intestinal tract. With achlorhydria or diarrhea absorption may be interfered with. With hypermetabolism more of these substances are needed. Likewise, infection, hypometabolism, toxemia as from nephritis, or poisons as lead may interfere with normal marrow activity and influence the building of red cells and the formation of hemoglobin. All such possible influencing factors must be taken into consideration in deciding on the use of liver and iron in the treatment of anemia.

In clinical anemia there may be a lack of the erythrocyte-maturing factor, a lack of iron, or of both specific elements. The need may result from a deficiency in supply, absorption or utilization or from an increased need from growth, pregnancy or increased metabolism. If the specific factions of liver and iron are required because of a deficient supply or a greater need, the giving of adequate amounts should overcome the deficiency. If there is some disease or abnormal condition which diminishes the size of the marrow as leukemia, or prevents the normal activity of the marrow as nephritis, it is apparent that increasing the supply of the erythrocyte-maturing factor and iron is of little value if any. In

some cases where there is deficient utilization, an added amount of a specific factor may enable the bone marrow to take up more. Only a small percentage of the iron taken in, for instance, is converted into hemoglobin. The utilization of iron may be greatly influenced by some toxic process as infection. Here it is possible that an added amount of iron may be of help although the defect is not really in supply. Little is known about the amount of the erythrocyte-maturing factor used. In the hemolytic anemias with a rapid regeneration of red cells, as indicated by a high reticulocyte count, it is possible that the supply of erythrocyte-maturing factor may not be adequate to supply the excessive demand. Here liver may help. It is distinctly unusual, however, for liver and iron to be of much clinical aid in the treatment of anemia unless there is a defect in supply or absorption of the specific factor of liver and iron in the light of the amounts needed.

An iron deficiency is by far the most important cause for an anemia because of the small reserve supply of iron, the needs for growth, pregnancy and lactation, the relatively small amounts of iron in the food, and the frequent significant loss of iron by chronic, long-continued hemorrhage as from hemorrhoids and menorrhagia. If iron is lacking to make hemoglobin, the first laboratory manifestation is a low color index, showing that the stroma is not filled with hemoglobin. As the iron deficiency continues and becomes more severe, the cells become smaller since there is no point in having stroma if there is no hemoglobin to fill it. Early then in an iron deficiency anemia the cells are of normal size but do not have the normal complement of hemoglobin, so the anemia is normocytic and hypochromic. Later, the anemia is microcytic and hypochromic. There is seldom any marked decrease in the number of cells.

With a deficiency in the erythrocyte-maturing factor, as in pernicious anemia, the bone marrow becomes red through the piling up of cells which are not ready to leave the marrow. Immature cells are larger than mature erythrocytes. As the erythrocyte-maturing factor (EMF) is incorporated, the cell becomes smaller. If there is a deficiency of this specific factor, the cells are thus larger and usually contain more than the normal amount of hemoglobin. Such an anemia is macrocytic and usually hyperchromic. The number of cells is usually greatly decreased.

If a laboratory study shows a hypochromic and microcytic anemia, there must be a deficiency in supply or utilization of iron. With a macrocytic and hyperchromic anemia there is a lack of supply or utilization of the erythrocyte-maturing factor (EMF). In the anemia due to an iron deficiency as for instance with an adequate intake, the hopper supplying iron is not filled. Such cells as are delivered from the marrow are small and deficient in hemoglobin. The indication is to fill the iron-containing hopper by giving iron preparation. In anemia due to an inadequate supply of the erythrocyte-maturing factor one hopper is empty so the indication for treatment is to give liver or liver substitutes. Such red cells as are turned out are larger and filled with hemoglobin.

Rarely there may be a deficiency of both iron and the erythrocyte-maturing factor. Since the effect of a deficiency in iron on the red cell is just the opposite of that of a lack of the erythrocyte-maturing factor, a normocytic and normochromic anemia may result from this combined deficiency so the deficiency would not be detected by the laboratory study.

Since the use of liver and iron depends on knowledge of the physiology of the red cell, the following facts discussed above may be summarized:

1. Red cells and hemoglobin are constantly being lost and replaced.
2. The change is very rapid, so a trillion erythrocytes and 30 grams of hemoglobin are replaced daily.
3. Specific and nonspecific elements are necessary for making red cells and hemoglobin.
4. The nonspecific materials are the protein, fat, carbohydrates, vitamins, and mineral salts required to make all cells.
5. The specific elements required are (a) the erythrocyte-maturing factor (EMF) supplied by liver and liver substitutes to make stroma of red cells and (b) iron for the synthesis of hemoglobin.
6. The supply of erythrocyte-maturing factor is normally adequate to meet even abnormally large demands as the liver and other organs contain a large reserve.
7. Added amounts may be required when (a) a normal amount is not made in the stomach as in pernicious anemia, (b) the bone marrow can-

not utilize the specific principle normally and (c) when there is an extensive long-continued demand as in a hemolytic anemia where the formation of new cells proceeds at an abnormally rapid speed to compensate for cells lost.

8. The reserve store of iron is small so an iron deficiency develops quickly if iron is lost through hemorrhage or if the intake of iron is insufficient to meet normal needs.

9. Additional iron is required to supply the (a) normal increase in store of iron necessary for growth, the increased use in pregnancy and lactation and the loss of iron incident to menstruation and (b) the deficiency of iron due to an inadequate intake, increased loss through hemorrhage, and the added amount necessary to supply the increased needs in hyperthyroidism, in decreased absorption due to achlorhydria or diarrhea, and in impaired utilization of iron by the marrow in myxedema.

10. The need for the erythrocyte-maturing factor is shown by a macrocytosis of the red cells indicated by an increased volume index.

11. A lack of iron is shown by a hypochromia of the red cells indicated by a low color index. With a long-continued iron deficiency, a microcytosis shown by the low volume index is present also.

The use of liver and iron in the treatment of anemia is only an application of the physiologic principles already discussed. A diet rich in animal protein and containing an abundant amount of fruit and vegetables should always be insisted on. A liberal serving of liver should be taken as often as possible. The liver may be cooked in any way desired. Heat at the usual cooking temperatures does not affect the specific principle. Whenever possible, it is most valuable each day to add liver cocktail containing equal amounts of ground broiled liver and tomato juice with the addition of a teaspoonful of yeast extract (vegex).

It is difficult, however, to administer enough of the specific principle of liver (erythrocyte-maturing factor) unless concentrates of liver or gastric mucosa are given. The liver concentrates are the preparations of choice since these are available for both oral and parenteral use. Preparations made from gastric mucosa can be given by mouth only. The parenteral use of the erythrocyte-maturing factor is the most effective. The same amount of the specific principle of liver is at least thirty times as active with parenteral as with oral use. The efficacy of oral administration often decreases as the patient gets older, and with long-continued use. Parenteral treatment is also more economical than oral administration when one considers the comparative amounts of the specific principle necessary to return the blood to normal, and to keep it so.

There are many liver preparations available for specific therapy. Unfortunately, these vary greatly in potency and so in therapeutic effect. The better liver extracts are now standardized on the basis of units. One unit is the amount of specific principle needed to keep the blood normal for one day. Too much dependence, however, cannot be placed on the number of units any given preparation is supposed to contain. The extracts can be standardized only on patients so one cannot be sure that a unit is always the same. Patients with idiopathic pernicious anemia vary greatly in the amount of the erythrocyte-maturing factor required to make the blood normal and to keep it at a normal level. A potent preparation of a responsible manufacturer only should be used. Even with such a preparation the best method of administration should be determined by each clinician. A concentrated extract containing 15 units per cc. is the best for uncomplicated cases of pernicious anemia. If there is a significant neurologic lesion, a less concentrated extract is more effective. We have used a preparation containing 5 units per cc. in such cases.

The most important and spectacular application of liver therapy is in the treatment of idiopathic pernicious anemia. The seriousness of this disease is best shown by the fact that it was uniformly fatal before the discovery of the value of liver by Minot and Murphy. If completely treated, however, the disease should never be of any significance to the patient. If not completely treated, the patient may seem to progress satisfactorily but may continue to have a persistent mild anemia. All too often, however, the undertreated patient will develop a subacute combined sclerosis of the spinal cord which may be very serious while the mild anemia is unimportant. It is much better to overtreat than to undertreat a patient with pernicious anemia since the cost of therapy is small as compared with the seriousness of the disease.

Many different plans of treatment have been

suggested. We have used the following procedure for a number of years with excellent results. When the patient first presents himself with active pernicious anemia or when in relapse, a subcutaneous injection of 1 cc. of a concentrated extract containing at least 15 units of the active principle is given daily for fourteen days. During this time, if possible, the patient is kept in bed. As soon as the appetite returns, which is usually from the fifth to seventh day, the anemia diet with the addition of a liver cocktail daily is begun. A similar injection is given twice a week for the remainder of a three-month period. For the second three months an injection is given once a week and for the next six months one every two weeks. After this period of one year, usually only one injection each month is required if the preparation referred to is used although one would think that this would not be adequate judging from the standardization of 15 units. We have many patients who have been treated in this manner for as long as seven years. The blood has remained entirely normal and a cord lesion has never developed in a patient completely treated.

If the patient has a combined sclerosis of the spinal cord before treatment is begun, therapy should be even more vigorous. This may be carried out by continuing the frequent injections for a longer period, by eating more liver and by taking liver extract by mouth also. It is best in such cases to use a less concentrated extract since elements contained in liver other than the erythrocyte-maturing factor may help in combating the spinal cord lesion. We have used here 3 cc. injections of an extract containing 5 units per cc.

The best criterion of efficient and complete therapy is the maintenance of the red cell volume. That is easily determined by the hematocrit and cell counts. It is true that almost without exception the volume is normal if the count is five million or over in a man and four and a half million and over in a woman. A complete blood study should be done at least every three months as long as the patient lives. An increase in the volume of the red cell beyond the normal always heralds a relapse or indicates incomplete therapy.

The manner of administration of liver extract in the anemia of pregnancy, of sprue, of congenital hemolytic icterus, and of other clinical states in which there is decreased absorption, increased need or impaired utilization of the specific principle must be determined for each patient on the basis of the need, and treatment given accordingly.

A hypochromia of the red cells indicated by a low color index with or without a microcytosis indicates that the stroma of the cell is not filled with hemoglobin. This deficiency is due to an insufficient supply of iron in the bone marrow or a defect in the utilization of iron by the reticulo-endothelial cells of the marrow. If the defective utilization of iron is the basis of the iron deficiency, large doses may be given with the hope that at least some of it will be used. Only rarely, however, is this true.

If the iron deficiency is due to an insufficient intake, or to an increased loss of iron by hemorrhage, the formation of hemoglobin is rapid and the defect is completely compensated for if an effective preparation of iron is given.

If iron is needed, it should always be given in adequate dosage. Only a fraction of the iron in any medicinal preparation is utilized and with some preparations this fraction is exceedingly small, so large doses are always necessary. Almost any iron preparation is effective if it is given in large enough doses. The size of the dose depends on the chemical state and solubility. Many different commercial preparations are offered. It is most probable, however, that iron is absorbed and utilized best in the ferrous state. Iron is present in the hemoglobin molecule in the ferrous form. For this reason it is far better to give iron as a ferrous salt. The different preparations of iron commonly used vary greatly in the percentage of utilization and hence in the dosage necessary for the desired therapeutic effect. Witts[3] gives the following figures for the most frequently prescribed preparations.

TABLE 1

Preparation	Effective daily dose grains	Iron content mg.	Utilization of iron per cent.
Metallic:			
Reduced iron	20-90	1,200-5,000	0.5-2
Ferrous:			
Ferrous chloride	4-8	100-200	12.5-25
Ferrous sulphate	9-12	180-240	14.0
Ferrous carbonate (as Blaud's pill)	45-60	300-400	8.0
Ferric:			
Ferric ammonium citrate	60-120	800-1600	1.5-3

It is apparent from these figures that the ferrous salts are far preferable to reduced iron and

ferric salts. The ferrous salts as now available are inexpensive and should usually be used. I see no justification for using the ferric salts or reduced iron. Blaud's pills (as supplied in the tabloid Blaud's pill by Burroughs, Wellcome & Co.) are made by mixing ferrous sulphate with sodium carbonate so they contain both ferrous carbonate and ferrous sulphate. A 10-grain tabloid pill contains 2 3/5 grains ferrous sulphate and 1 4/5 grains sodium carbonate which is sufficient to form 2 grains ferrous carbonate. When given in doses of 20 grains three times a day, excellent results are obtained. Ferrous carbonate 12 to 18 grains; ferrous sulphate, 9 to 12 grains; and ferrous chloride, 4 to 8 grains daily, give a maximum reticulocyte and therapeutic response. The rate of hemoglobin increase is greater when the hemoglobin level is very low at the beginning of treatment than when higher. An effective iron preparation should increase the hemoglobin one to two per cent each day and give a reticulocyte rise.

The oral preparations of iron are so effective and satisfactory that there seems little reason giving iron parenterally. Iron given parenterally is thirty times as active in the formation of hemoglobin as when given by mouth but the margin between effective and toxic doses is small. Utilization is good by mouth and ferrous salts are cheap.

If the deficiency in iron is supplied, there is no point in continuing therapy when the cause for the deficiency is eliminated. In idopathic hypochromic anemia associated with achlorhydria there is usually some difficulty in the absorption of iron from the gastro-intestinal tract so the anemia will recur if treatment is stopped entirely. Here the best method is to give some iron for one week of each month even after the blood has become normal.

There has been much discussion concerning the value of supplementing iron with copper. In adults there is little clinical evidence that added copper is of value in the regeneration of hemoglobin. Likewise, there seems little reason for adding vitamin B to supplement iron or liver.

There is seldom any indication for giving iron and liver extracts together. If the erythrocyte-maturing factor is needed, iron is seldom lacking. If iron is indicated, the anemia is seldom influenced by liver extract. Only rarely is an anemia due to a deficiency of both iron and the specific principle of liver.

If there is an achlorhydria with a hypochromic anemia, liver extract may be needed and valuable. In the presence of free hydrochloric acid this is seldom true. An iron deficiency is seldom present in a macrocytic anemia. The important thing in every anemia is to determine the cause. If there is a deficiency in building materials, the element lacking should be determined and supplied in sufficient amounts. There is no point in wasting money on liver preparations if no deficiency in the specific maturing principle is present; iron should not be given if there is no lack of iron.

SUMMARY

1. The physiology of the red cell has been reviewed and the conditions influencing the supply and utilization of iron and the erythrocyte-maturing principle of liver emphasized.

2. The erythrocyte-maturing factor is best supplied as liver extract given subcutaneously or intravenously.

3. Pernicious anemia is due to an inability of the stomach to secrete the intrinsic factor of Castle with which the erythrocyte-maturing factor is made.

4. In pernicious anemia the lacking specific principle must be given throughout the life of the patient.

5. The patient with pernicious anemia should be overtreated rather than undertreated to prevent the development of a cord lesion or a recurrence of the anemia.

6. The macrocytosis of the red cells characteristic of a deficiency in the erythrocyte-maturing factor disappears with complete and adequate therapy and reappears whenever the treatment is inadequate.

7. Iron should be given orally in the ferrous form and in adequate dosage.

8. Parenteral iron therapy is rarely indicated.

9. If iron is correctly given, the hypochromia and microcytosis characteristic of an iron deficiency dissappears.

10. It is seldom necessary to give iron and liver extract together. Liver extract is of value in a hypochromic anemia only in the presence of an achlorhydria.

11. Conditions which unfavorably influence

the absorption and utilization of iron and the specific principle of liver should be searched for and corrected.

2020 E. 93 St.

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THE INJECTION TREATMENT OF HEMORRHOIDS; RESULTS WITH A SODIUM PSYLLIATE SOLUTION

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The injection treatment of hemorrhoids consist of obliteration of varices by fibrous tissue formed following the injection of an irritating solution into or above the hemorrhoidal mass. The usual solutions used in this method of treatment are five per cent phenol solutions in vegetable oils, ten to 20 per cent solutions of phenol in water and glycerine, and five per cent solutions of quinine and urea hydrochloride in water. More recently various solutions used for the production of chemical thrombosis in varicose veins have also been used. The development of fibrous tissue proliferating solutions for the injection treatment of hernia seems to offer another method for producing fibrosis in the hemorrhoidal masses. It was decided to use one of these solutions, a five per cent aqueous solution of sodium psylliate* with two per cent benzyl alcohol, in a series of 50 patients with hemorrhoids to obtain information as to the efficacy of the solution used in treatment (table 1).

TABLE 1

Types of Patients Treated.	
Internal hemorrhoids.	
Group 1. Bleeding without protrusion.	31.
Group 2. Bleeding with moderate protrusion.	5.
Group 3. Bleeding with marked protrusion.	4.
Externo-internal hemorrhoids.	
Group 1. Bleeding without protrusion.	1.
Group 2. Bleeding with moderate protrusion.	6.
Group 3. Bleeding with marked protrusion.	3.

From the Department of Surgery, University of Illinois.

*The sodium psylliate used on the patients discussed in this report was kindly furnished by G. D. Searle & Company of Chicago.

TABLE 2

Number of Treatments Required.

No. of Weekly Treatments	Patients	No. of Treatments
1.	6	6
2.	8	16
3.	9	27
4.	11	44
5.	4	20
6.	4	24
7.	4	28
8.	1	8
9.	2	18
12.	1	12
	Total Treatments	203

TABLE 3

Amounts of Solution and Pain Reactions

Amount of Solution	Pain Reactions
1/4 cc.	3.
1/2 cc.	8.
1/3 cc.	1.
1 cc.	3.
Total	15 Reactions.

INDICATIONS FOR THE INJECTION TREATMENT.

In the rectal division of the Surgery dispensary of the Research and Educational Hospital we have formulated definite indications for the injection treatment of hemorrhoids. These indications have been reported in detail elsewhere.[1] Patients with internal or externo-internal hemorrhoids, and without associated surgical lesions of the anorectal region are divided into three groups with respect to symptoms present.

Group 1. Patients having no symptoms and where the hemorrhoids are found on anoscopic examination, or those with only painless rectal bleeding occurring at defecation. These patients give no history of protrusion. Thirty-nine per cent of these patients have internal and three per cent have externo-internal hemorrhoids.

Group 2. Patients complaining of bleeding with some protrusion on defecation, but where the protruding mass is reduced spontaneously after defecation. Four per cent of these patients have internal and 21 per cent have externo-internal hemorrhoids.

Group 3. Patients with a history of rectal bleeding and with a marked protrusion at stool or which may occur spontaneously, and where the mass must be replaced digitally. Only eight per cent of these patients have internal hemorroids while 21 per cent have externo-internal hemorrhoids.

Injections are recommended in all patients in group 1, and produce about 90 per cent clinical cures. Injections are used in patients in group

2, if they refuse operation although only about 50 per cent will result in clinical cures. Group 3 are considered surgical cases and injections are used in these patients only to control bleeding until such time as they can be admitted for operation. In a series of 100 patients previously reported, about 40 per cent were treated by injection and about 60 per cent were recommended for operation.

TECHNIQUE OF INJECTION

The instruments needed for the injection treatment of hemorrhoids are a tubular anoscope, either electrically lighted or used with a head lamp, and a hypodermic syringe with a two-inch 24- to 22-gage needle. The patient who has been previously examined with a sigmoidscope, requires no other preparation than the emptying of the rectum by a normal bowel movement. He is placed in either the left lateral or knee chest position as prefered by the physician. The needle is attached to the syringe and one cc. of the sodium psylliate solution is aspirated into the syringe. The well lubricated anoscope is inserted into the anus and the obturator withdrawn. Manipulation of the anoscope allows the hemorrhoidal mass to project into the lumen. The mass is touched with an applicator dipped in alcohol. The point of the needle is inserted into the upper portion of the mass, below the mucosa and superficial to the muscularis. When in the proper location the needle can be easily moved in the submucosa. Aspiration is first done to make certain that the needle is not in a blood vessel, and then from ¼ to ½ cc. of the solution is injected. The needle is left in place for one minute during which time the mass will be seen to swell and become edematous. The needle is given a full rotation on its longitudinal axis and then withdrawn. If the masses are of any considerable size, only one hemorrhoid is injected at a treatment. The total amount of solution used is never more than one cc. at any one treatment. The anoscope is withdrawn and the patient is allowed to leave. Injections are given at weekly intervals until the hemorrhoidal masses are obliterated.

RESULTS

Amount of fibrosis produced. Following the injection of the sodium psylliate solution there is a prompt edema of the hemorrhoidal mass. The swollen area feels boggy to the touch for about three days and then becomes quite firm. At the end of a week there is a definite induration at the site of injection which appears to extend upward into the submucosa for a short distance. If an attempt is made to introduce a needle into the indurated mass the tissue is so firm that it is difficult to enter the submucosal layer. By the end of the second week the palpable induration has disappeared, but the submucosa still feels resistant when an attempt is made to introduce the needle. If induration has been sufficient further injection into the area is difficult, but if the fibrosis has not been complete it is possible to reinject with a smaller amount of solution. Following the course of treatment the induration disappears and the mass is so reduced in size that it does not protrude into the lumen of the anoscope, as it did before the treatments were started. It is our impression that a smaller amount of sodium psylliate will produce the same degree of fibrosis, and produce it more promptly than will the phenol solutions. It is more nearly comparable with the results produced by five per cent quinine and urea hydrochloride.

Number of injections necessary. In the series of 50 patients observed in the dispensary, thirty-four required four or less weekly treatments, and sixteen required five or more. The number of treatments necessary is shown in table 2.

Control of bleeding. Thirty-eight of the 50 patients complained of some degree of rectal bleeding. In 24 of these patients the bleeding stopped after one injection, in seven after the second, six after the third and only one required four treatments before bleeding stopped. Several patients had had previous injections of either phenol in oil or quinine and urea hydrochloride without control of bleeding. It is our impression that bleeding is controlled more promptly with sodium psylliate than with other solutions.

Control of prolapse. Thirty-two of these patients had no prolapse; eleven had a moderate degree of prolapse which was controlled after the treatments. In seven patients with marked protrusion (group 3) there was still some protrusion at defecation after the treatments were discontinued.

REACTIONS

The untoward reactions following the use of

sodium psylliate solution were of two types: local reactions that consisted of pain of varying severity after injection and general reaction similar to shock or allergic reactions.

Pain following the injection was more common. This occurred in some degree in twelve of the 50 patients, and in 15 of 203 treatments; about seven and one-half per cent. Two patients had pain after two or three injections, but the remainder had pain only once. The amount of solution used did not seem to be a factor in the production of pain (table 3). The average dose in the total series was ½ cc. Eleven times ¼ cc. was injected, ten times one cc. was used. In two instances two cc. was injected, and neither of these patients had pain following injection.

The pain usually came on within one-half to two hours after injection and lasted for 24 to 48 hours. It was never severe enough to require more than the coal tar analgesics and sometimes the application of heat to the perineum.

General reactions occurred in two patients. In the one there was weakness and pallor, nausea, profuse perspiration and rapid pulse following the injection of a two cc dose of solution. The reaction was relieved by the injection of two three-minim doses of adrenalin chloride 1/1000. Although there was no history of allergy or drug sensitivity the use of sodium psylliate was stopped in this instance.

The other patient felt "shaky" and weak immediately after the injection of ½ cc. of solution. This subsided without treatment and the patient left the dispensary after 30 minutes. On the patient's return the next week there was an area of moist dermatitis around the anus which we felt was probably allergic and resulted from the sodium psylliate. Treatments were continued at twice weekly intervals with much smaller doses, in an attempt to immunize the patient, and the dermatitis disappeared after two weeks. The patient received six further treatments without recurrence of the skin lesions or other evidences of allergic manifestations.

It was felt that the sodium psylliate solution should not be used in patients that might have had previous intravenous injections for varicose veins. The total dose should be small enough to not distend the hemorrhoidal masses unduly, and thus reduce the possibility of local pain following injection. Injections should be made into the submucosa well above the anorectal line.

CONCLUSIONS

1. The use of five per cent sodium psylliate solution is reported in a series of 50 patients.
2. The patients were selected as being suitable for injection treatment, or were treated to control bleeding while awaiting operation.
3. The control of bleeding was more prompt and effective with injections of sodium psylliate than with phenol or quinine and urea hydrochloride solutions.
4. The amount of fibrous tissue produced was satisfactory.
5. Fewer injections were necessary to produce a clinical cure than with the other solutions used.
6. Reactions which occurred were chiefly those of local pain following injection. There were two general reactions noted, neither of which proved to be severe.

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HYPOPITUITARY STERILITY IMPROVED BY SPLITTING THE OVARY

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A house without children is not a home, and it is biologically unsound since husband and wife are not united by the strong band that is created through the common care for the child of their own blood. Sterility, therefore, is one of the foremost causes of unhappy marriages. In the United States alone there are two million childless couples who are still in the childbearing age, which is an important factor in maintenance of the greater community — the state.

The physician, when he is confronted with a case of sterility, should expend every effort to determine its cause. This calls for close cooperation between the physician and the patient and is often a long, tedious and difficult task.

Sterility may be caused by general diseases, such as syphilis, tuberculosis; by disease which lead to a reduction of the strength of the body, or to psychological causes such as frigidity and dyspareunia. In addition to these, there are the mechanical (anatomical), chemical or hormonal causes resting in the female genitalia. For example, a strong acid reaction of the vaginal con-

tents can kill the spermatozoa so soon that they cannot reach the uterus and tubes. There may also be disturbances of the ovaries, pituitary or thyroid glands. The part which other endocrine glands play in sterility will not be discussed, since in those cases sterility is not the main complaint. For the same reason, sterility caused by the male partner will not be discussed.

CASE REPORT

The patient was a woman who had been married for four years without conceiving. Her menses had been established at the age of fifteen years; periods are regular and of five days' duration.

Examination of the patient reveals her to be 156 cm. tall; the measurements of the upper border of the symphysis-floor and symphysis-vertex are the same, namely 78 cm.; the span corresponds to the height, 156 cm. The pelvis is small in all its diameters: Interspinous 20 cm., intercristous 24 cm., Baudelocque 17 cm., conjugata vera 8 cm. The uterus measure: os externum to fundus 6 cm., and the uterus itself is rather small and feels harder than normal. The ovaries are hard, small bodies. Her blood pressure is 100/80; the teeth are hypogonadal, with large central and stunted lateral incisors, and, in general, the patient is thin.

From the measurements given above, it is noted that the patient is small. The diagnosis of small stature offers no difficulties in a child, but is not so easy in an adult. Growth after birth is governed by the thyroid, pituitary and sex glands. Of these, the thyroid gland is most important in early postnatal life; the pituitary assumes a leading role somewhat later and continues to rule up to the completion of skeletal development. The effects of the sex glands appear during adolescence. The harmonious action of these three glands leads to a normal development. Disturbance of function of any one of them is followed by secondary changes in function of the others, often to such an extent that it is difficult to determine which gland is primarily at fault.

In the patient herewith presented, we find stunted growth, leanness, hypoplastic uterus and ovaries. If the thyroid gland were the cause of the small stature, one would find short legs and a long trunk. However, a disturbance of the thyroid could have been present in early childhood only, as there is no evidence of other hypothryoid stigmata as myxedema and sluggishness. In dysfunction of the thyroid gland, genital development is normal and the basal metabolism is low. In this patient the metabolic rate was normal, the uterus and ovaries hypoplastic, and menstruation regular.

Failure of growth stimulation by the pituitary gland produces a rather uniform lack of development; there is no disproportion between the upper and lower half of the body, and the lack of growth is usually associated with other manifestations of pituitary deficiency, as obesity and infantile genitalia. The hypopituitary patient shows small, pretty features, soft silky hair, large teeth in excellent condition, and hypoplastic genitalia; the basal metabolic rate is normal, there is lack of pneumatization of the bones of the skull, i. e., rudimentary sinuses and scanty diploe. We find no obesity in this case and the teeth are of the hypogenital type. In general, the disturbances here seem to point to the pituitary gland, since anatomical causes, such as cervical infection and non-patent tubes, had been excluded.

In this woman there was a small infantile uterus and small hard ovaries which apparently were not able to produce mature ova. Injections of the patient's blood serum in infantile mice showed the presence of estrogenic substance during the week before menstruation in an amount not different from normal menstruating women; anterior pituitary hormone was not present in an amount to produce hemorrhage or luteinization in infantile mice ovaries. For the experiments infantile or spayed mice were used and the changes of uterus and ovaries were watched.

The picture in this case was that of anovulatory menstruation in a patient with infantile ovaries, uterus and tubes and consequent sterility. In anovulatory menstruation the graafian follicle begins to mature and produce increasing amounts of estrogenic substance. Rupture of the follicle, however, does not occur but the process continues until the ovum dies. Then the granulosa degenerates and production of estrogen ceases and, after an interval, bleeding occurs; thus there is produced a periodic bleeding which resembles the normal menstruation. In cases of a persistent follicle cyst we find an enlargement of the uterus which simulates pregnancy, but bleeding takes place at irregular intervals and is protracted, taking place when the cystic-hyperplastic mucosa of the uterus causes ulcers by pressure. Sterility occurs in anovulatory menstruation because there are no mature ova present, and the diagnosis of "anovulatory cycle"

was confirmed in this case by a specimen taken from the uterine mucosa in which no secretory phase was found during several cycles.

The treatment of endocrinopathic sterility in general has not been very successful, due to the limited knowledge of the pathology concerned. Disregarding the male partner, there is necessary for conception the production of mature ova, patent tubes, and an adequate sized uterus in the secretory phase, having sufficient musculature to retain and develop the fertilized ovum. In this particular case it was necessary to enlarge the uterus and tubes to more nearly normal size, and to produce ovulation with the consequent formation of corpora lutea and the secretory phase of endometrium.

To acquire enlargement of the uterus, estrogen was given hypodermically over a prolonged period until the cervixfundus measurement was 7.5 cm. and the endometrium showed a tendency to reach the cystic hyperplastic stage which we find in persistent folliculin cysts. When the uterus had reached this stage of enlargement, an attempt was made to produce ovulation by the injection of gonad stimulating hormones of the anterior pituitary gland, using pituitary-like hormone, pituitary hormone and gonad stimulating hormone from mares' serum. Injections were given hypodermically during the first half of six menstrual cycles and were then discontinued, since the results were not encouraging. It should be remembered that it is not a difficult problem to produce ovulation, luteinization and a secretory phase of the endometrium in normal ovaries, but there is apparently a difference between normal and infantile ovaries. With this in mind and since a long continued application of gonadotropic hormone leads to general luteinization with exhaustion of the grafian follicle material, it was thought best to remove the obstacle to ovulation presented by the hard ovarian capsule.

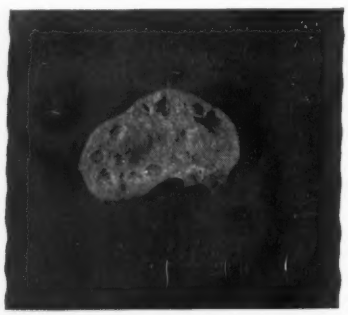

Figure 1. Longitudinal section through the ovary, natural size, with dilated follicles, some lutinized.

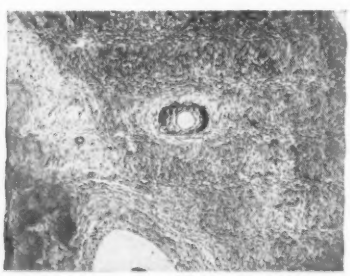

Figure 2. Magnified 45 diameters shows immature ovum, dilated follicles, lutinization none reaching ovarian surface.

This was done by splitting one ovary from its convexity down to the mesovarium and turning it inside out. The cut margins were sutured to the mesovarium or broad ligaments so that a large amount of ovarian tissue was liberated from the hard ovarian capsule. At the same time a disc of the whole ovary was obtained which, upon microscopic examination, showed many dilated graafian follicles, areas of luteinization, but nowhere was the ovarian capsule pierced.

After the operation gonadotropic substance from mares' serum was continued and during the second cycle conception took place and in due time a strong healthy boy was born.

CONCLUSIONS

1. While there is no difficulty in obtaining ovulation in normal ovaries, the problem is entirely different in infantile ovaries, tubes and uterus.

2. Infantilism is due to hypofunction of the pituitary gland.

3. An attempt was made to obtain ovulation and fertilization by means of estrogen and various pituitary substances, without result.

4. Because it was felt that the hard ovarian capsule prevented an escape of the ovum, the ovary was split and the cut margins sutured to the broad ligament; operation performed via the vaginal route.

5. Conception took place during the second cycle following operation, resulting in the birth of a strong baby boy in due time.

6633 Sheridan Road.

Remark: It is interesting that the patient 2 years after her first delivery became pregnant again and gave birth to a healthy baby without any kind of treatment. The turning inside out of the ovary was apparently sufficient.

A SURVEY OF CONGENITAL ANOMALIES AS FOUND IN 1131 NECROPSIES

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The increasing development of embryological knowledge makes it difficult for the pathologist to keep up with developmental pathology as seen in the postmortem room. The embryologist, on the other hand, very rarely has opportunity to follow a great number of necropsies and thus learn the incidence of anomalies and their effect upon the individual. Unless he does so, however, he sees only those single cases which are referred to him because the physician or pathologist is particularly interested in them. As a research fellow of the Cook County Graduate School of Medicine I had the opportunity to investigate the postmortem material of the Cook County Hospital from the embryological point of view. During ten months I was able to see a considerable number of cases of developmental pathology which briefly will be reviewed here. I wish to acknowledge the kind support of Dr. W. Schiller, Director of Laboratories of the Cook County Hospital, in making this work possible.

Most statistics on malformations are made with regard to the occurrence of particular types among a number of patients, necropsies, or malformations in general. The heterogeneity of the work done can very well be seen in Schwalbe's ('06) extensive review (1. c., p. 202), and there has been no considerable change since. Only Serdukoff ('29) gives a table of all the malformations seen among 7,143 births, of which, however, only a small number were investigated by necropsy. Due probably to the latter fact, he found not more than 64 malformations. I hope to show in the following that such statistical work can bring up a number of interesting questions and will also help to answer them, if carried out on a large scale.

The present review includes malformations proper, as well as embryonic diseases, because these cannot be sharply separated. A malformation may predispose the bearer to a disease in embryonic or postnatal life, and an embryonic disease at the time of a certain developmental process may cause a malformation. Only gross pathology can be considered here, but many findings were verified by histological methods. When examining histological malformations, we face different problems such as, e. g., the developmental potencies of single cells or cell groups. Therefore this part of developmental pathology will not be included here. However, both groups cannot be sharply limited from each other.

Table 1 gives a chronological enumeration of the congenital anomalies as observed from July 1, 1938, to April 30, 1939, among 1,131 necropsies.

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TABLE 1

No.	race	sex	age	developmental anomalies or fetal diseases
				1938
SB 48	w	m	stillborn	Urogenital tract: bilateral hydroureter
SB 49	n	f	stillborn	Urogenital tract: patent urachus
725	n	f	premature	Urogenital tract: patent urachus
729	w	m	46 d	Urogenital tract: absence of left kidney
731	w	m	16 m	Nervous system: spina bifida occulta
732	n	f	6 m	Heart: defect of interventricular septum, patent foramen ovale and ductus arteriosus
737	n	f	55 y	Urogenital tract: right double ureter
738	n	m	7½ m	Nervous system: hydrocephalus, sacral spina bifida
740	n	f	3 m	Heart: interauricular septum defect
742	n	f	5 w	Spleen: accessory spleen
748	w	m	infant	Erythroblastosis fetalis
751	n	f	22 m	Heart: defect of interventricular septum, aorta and pulmonary artery originate from right ventricle
766	w	f	premature	Heart: aorta originates from right ventricle, hypoplasia and stenosis of pulmonary artery, defect of interventricular septum Diaphragm: almost completely absent on right side

				Extremities: 4 toes on left foot
				Intestine: incomplete rotation
				Spleen: two accessory spleens
768	w	f	50 y	Urogenital tract: right double ureter
781	w	m	newborn	Heart: aorta and pulmonary artery from right ventricle, hypoplasia of pulmonary artery, patent foramen ovale and ductus arteriosus
				Respiratory tract: incomplete lobation of lungs
787	w	f	39 y	Digestive tract: Meckel's diverticulum
791	w	m	54 y	Digestive tract: Meckel's diverticulum
803	w	f	13 d	Heart: defect of interauricular septum
				Digestive and respiratory tracts: atresia of upper part of esophagus, lower part originates from bifurcation of trachea
				Urogenital tract: left hydroureter, stenosis at opening into bladder
830	w	f	premature	Heart: defect of interventricular septum
				Extremities: right talipes equinovarus
SB 57	w	m	stillborn	Oral and nasal cavities: cheilognathopalatoschisis
865	n	m	64 y	Urogenital tract: multiple cysts of kidneys
				Digestive tract: multiple cysts of liver
SB 60	?	f	stillborn	Respiratory tract: abnormal lobation of lungs
879	n	m	89 y	Urogenital tract: multiple cysts of kidneys
883	w	f	52 y	Urogenital tract: left ureter fissus
898	w	f	newborn	Heart: hypertrophy
910	w	m	55 y	Respiratory tract: abnormal lobation of lungs
935	w	m	13 m	Urogenital tract: hypoplasia and cystic degeneration of left kidney
942	w	m	7 d	Extremities: ulnar deflexion of distal parts of fingers of both hands
945	w	m	63 y	Urogenital tract: multiple cysts of kidneys
967	w	m	42 y	Urogenital tract: multiple cysts of kidneys
970	n	f	2½ m	Heart: patent foramen ovale and ductus arteriosus
973	n	f	9 m	Heart: atrium not divided and not communicating with right ventricle, defect of interventricular septum
977	n	f	35 y	Urogenital tract: right double ureter
SB 71	n	f	stillborn	Nervous system: anencephaly, cervical myeloschisis
				Oral and nasal cavities: cleft palate, defect of nose septum
981	w	f	4 m	Urogenital tract: bilateral double hydroureters, multiple cysts of kidneys
991	n	f	9 m	Digestive tract: malposition of proximal half of colon
998	w	m	58 y	Urogenital tract: multiple cysts of kidneys
				Digestive taact: multiple cysts of liver
1,000	w	f	60 y	Urogenital tract: multiple cysts of kidneys
1,004	w	m	1½ m	Nervous system: lumbosacral myelomeningocele, internal hydrocephalus
1,007	w	f	58 y	Urogenital tract: multiple cysts of kidneys
1,014	w	f	3 w	Spleen: cyst
1,023	w	m		Urogenital tract: absence of left kidney
				Blood vessels: abnormally high bifurcation of aorta
1,034	w	m	36 y	Digestive tract: Meckel's diverticulum
1,040	ind.	f	37 y	Digestive tract: cecum and colon ascendens mobile
				Respiratory tract: abnormal lobation of left lung
1,046	w	m	3 d	Abdominal wall: amniotic umbilical hernia
				Digestive tract: absence of caudal part of large intestine, fistula between cecum and bladder
				Urogenital tract: exstrophy of bladder with fistula of cecum, division of penis and scrotum into separate lateral halves
SB 79	w	f	stillborn	Nervous system: anencephaly
1,053	w	m	68 y	Urogenital tract: multiple cysts of kidneys
1,054	n	m	4 m	Heart: defect of interventricular septum, stenosis of pulmonary artery, patent ductus arteriosus
1,075	w	m	74 y	Urogenital tract: hypoplasia of left kidney, multiple cysts in both kidneys
SB 87	mex	f	stillborn	Nervous system: internal hydrocephalus
1,088	w	f	1 d	Heart: complete absence of interventricular septum, hypoplasia of aorta, absence of mitral valve, patent ductus arteriosus
1,089	w	m	4 d	Digestive tract: defect of muscularis of the stomach, protrusion and rupture of mucosa
1,099	n	f	47 y	Urogenital tract: bilateral double ureters
1,101	w	f	25 y	Digestive tract: Meckel's diverticulum
				Spleen: accessory spleen
1,118	w	m	58 y	Spleen: accessory spleen
1,127	w	m	71 y	Urogenital tract: multiple cysts of right kidney
1,129	w	m	52 y	Digestive tract: multiple hemangiomas of the liver
1,133	w	m	21 y	Spleen: accessory spleen
1,153	w	m	2 m	Nervous system: internal hydrocephalus, sacral myelomeningocele
1,162	w	m	new-born	Nervous system: thoracolumbar myelomeningocele
				Heart: defect of interventricular septum
				Digestive tract: atresia of ductus cysticus
1,172	w	f	new-born	Urogenital tract: patent urachus
1,187	w	m	premature	Digestive tract: incomplete descensus of colon
SB 93	w	f	stillborn	Nervous system: anencephaly, cervicothoracic myeloschisis
1,193	w	m	36 y	Urogenital tract: hypospadias
1,196	n	f	41 y	Urogenital tract: multiple cysts of kidneys
				Digestive tract: Meckel's diverticulum
SB 96	n	f	stillborn	Spleen: accessory spleen

1,212	w	m	17 m	Respiratory tract: abnormal lobation of right lung
1,216	?	f	42 y	Urogenital tract: hypoplasia of right kidney
1,240	w	m	16 h	Respiratory tract: completely separated lobe of lung with no connection with bronchial tree Urogenital tract: hypertrophy of bladder
1,245	w	f	2½ m	Nervous system: internal hydrocephalus, lumbar meningocele
1,262	w	m	76 y	Spleen: accessory spleen
SB 101	n	m	stillborn	Digestive tract: benign "cystadenoma" of jejunum
1,286	n	m	55 y	Respiratory tract: abnormal lobation of both lungs
1,289	w	f	46 y	Spleen: accessory spleen
1,304	n	m		Urogenital tract: absence of left kidney
1,311	w	m	50 y	Urogenital tract: hypoplastic and dystopic right kidney
1,313	w	m	3 m	Nervous system: internal hydrocephalus, thoracolumbar meningocele Urogenital tract: bilateral hydroureters and stenosis of openings into bladder
1,316	w	f	3 w	Nervous system: internal hydrocephalus, thoracolumbar meningocele Heart: patent foramen ovale and ductus arteriosus
SB 105	w	m	stillborn	Nervous system: internal hydrocephalus Extremities: Shortening of left forearm, hand attached at right angle, fingers pointing radially, thumb absent
				1939
4	w	f	7 d	Erythroblastosis
14	n	f	4 m	Heart: defect of interauricular septum
20	n	m	40 y	Respiratory tract: abnormal lobation of left lung Spleen: accessory spleen
26	w		15 d	Urogenital tract: intersexuality: penis and female internal genitalia; horseshoe kidney, dilatation of ureters, dilatation, hypertrophy and diverticula of bladder Digestive tract: absence of lower part of large intestine Extremities: bilateral talipes equinovarus Abdominal wall: absence of muscles
30	w	f	8 w	Extremities: bilateral talipes equinovarus; right arm: contracture of forearm, one finger; left hand: four fingers, one of them attached just distal to the ulna
31	w	m		Digestive tract: malposition of cecum
32	w	f	25 y	Heart: aortic valve with two leaflets
37	w	m	59 y	Urogenital tract: multiple cysts of kidneys
38	n	m		Extremities: bilateral hexadactylism
44	n	f	63 y	Urogenital tract: multiple cysts of kidneys
54	w	m	43 y	Respiratory tract: abnormal lobation of left lung
56	n	f	46 y	Urogenital tract: right double ureter
70	n	f	new-born	Urogenital tract: dilation of bladder and ureters
72	n	m	2 m	Respiratory tract: abnormal lobation of left lung
99	w	f	65 y	Urogenital tract: right double ureter Digestive tract: Meckel's diverticulum
104	w	m	3 d	Heart: atresia of pulmonary ostium, fusion of leaflets; patent foramen ovale and ductus arteriosus
107	w	f	3 m	Spleen: six accessory spleens
115	n	f	51 y	Spleen: accessory spleens
129	w	f	55 y	Urogenital tract: hypoplasia of left kidney
132	w	m	premature	Anhydramnios, fusion of skin and amnion; deformities of right arm and hand and left side of face by amniotic adhesions
134	w	m	63 y	Heart: absent ostium of right coronary artery
135	w	f	21 y	Spleen: accessory spleen
136	n	f	38 y	Spleen: accessory spleens
137	w	m	1 m	Nervous system: internal hydrocephalus Eyes: cataracta Extremities: mild clubfeet
140	w	f	59 y	Spleen: accessory spleens
147	w	m	49 y	Urogenital tract: horseshoe kidney
157	w	f	3 y	Spleen: accessory spleens
159	w	m	53 y	Digestive tract: Meckel's diverticulum
181	w	m	29 y	Digestive tract: Meckel's diverticulum
194	w	m	6 m	Nervous system: internal hydrocephalus, myelomeningo-cystocele from 3rd thoracic vertebra downward
205	w	m	65 y	Urogenital tract: multiple cysts of kidneys
209	w	f	9 y	Urogenital tract: hypoplasia of left kidney
212	w	f	1 m	Nervous system: internal hydrocephalus, lumbar myelomeningocele Heart: patent foramen ovale and ductus arteriosus
215	w	m	5 m	Heart: defect of interventricular septum
216	w	f	72 y	Urogenital tract: multiple cysts of kidneys
SB 18	w	f	stillborn	Spleen: accessory spleen
239	w	f	79 y	Urogenital tract: multiple cysts of kidneys
255	n	m	6 w	Spleen: accessory spleens
264	w	m	63 y	Urogenital tract: multiple cysts and adenomas of kidneys
265	w	m	22 y	Heart: interventricular septum defect Digestive tract: Meckel's diverticulum
SB 22	n	m	stillborn	Heart: interventricular septum defect
273	w	f	25 y	Urogenital tract: dermoid of left ovary

277	w	f	2 d	Nervous system: anencephaly Respiratory tract: multiple areas of non-development of alveoli (?)
299	w	f	5 m	Nervous system: internal hydrocephalus, lumbosacral spina bifida Urogenital tract: right double ureter
SB 26	w	f	stillborn	Urogenital tract: hydronephrosis, hydroureters, hypertrophy of uterus, elongation of vagina Teratoma of coccygeal region
345	?	m	1 d	Multiple foci of hemopoiesis in the liver
350	w	m	1 d	Abdominal wall: amniotic umbilical hernia
363	w	f	44 y	Urogenital tract: hypoplasia of right kidney
374	w	m	60 y	Urogenital tract: multiple cysts of kidneys
376	w	f	37 y	Spleen: accessory spleen
377	n	f		Urogenital tract: left double ureter
378	w	f	premature	Digestive and respiratory tracts: atresia of upper part of esophagus, lower part originating from bifurcation of trachea; imperforate anus, fistula between rectum and vestibule of vagina Urogenital tract: fused kidneys on left side; fistula between rectum and vestibule and vagina
392	w	m	1 d	Heart and vessels: interventricular septum defect, abnormal origin of large arteries from arch of aorta Respiratory tract: agenesis of left lung
395	w	f	premature	Urogenital tract: patent urachus
416	n	m	23 y	Urogenital tract: double right ureter
429	w	f	76 y	Urogenital tract: double right ureter
430	w	m	10 m	Digestive tract: free mesentery of entire colon Diaphragm: partial absence of muscles Extremities and body: deformities of neck, chest, hands; scoliosis, talipes calcaneovalgus
432	n	f	22 d	Heart: patent ductus arteriosus

It is difficult to draw a line between malformations and minor irregularities which are still within the limits of normal variability. Moreover, many minor malformations are not worth mentioning. Therefore, an artificial line must be drawn and it is impossible to do it in a way which agrees with everyone's conception. Single cysts in the kidneys, e. g., are not recorded here because they are too frequent and too unimportant from both the practical and the theoretical points of view. On the other hand, multiple cysts are considered because they apparently show a generalized abnormal disposition of the anlagen of the kidney.

Club feet are noted as independent malformations only in the absence of anomalies of the spinal cord. Patent ductus arteriosus is recorded among the heart anomalies because it is as a rule associated with congenital malformations of the heart.

Table 2 gives a review of the same material, classified as to the organs affected and, where practicable, as to the types of malformation. It also shows the incidence in different races and sexes. As multiple anomalies are very frequent, one case may appear several times in this table. Therefore the sum of malformations exceeds the number of cases by far. There is also a discrepancy in the numbers in some horizontal lines of the table since races other than white and negro are not considered because of their small incidence. However, these cases appear in the columns referring to sex and in the total numbers in the last column. On the other hand, the multiple malformations of the one inter sex on record are not entered in the sex columns.

TABLE 2

Organ, malformation	sex		race		total number of cases
	male	female	white	negro	
Nervous system					
Hydrocephalus	7	5	10	1	12
Anencephaly	1	3	3	1	4
Spina bifida	7	5	10	2	12
Eyes					
Cataract	1	0	1	0	1
Cardiovascular system					
heart	9	15	15	9	24
blood vessels	2	0	2	0	2
Face					
clefts of lip, jaw, palate	2	0	2	0	2
amniotic adhesions	1	0	1	0	1

Lungs					
abnormal lobation	7	1	4	3	8
separated lobe	1	0	1	0	1
absent left lung	1	0	1	0	1
areas of maldeveloped tissue	0	1	1	0	1
Digestive tract					
atresia of esophagus with tracheo-esophageal fistula	0	2	2	0	2
rupture of muscularis of stomach	1	0	1	0	1
cystadenoma of jejunum	1	0	0	1	1
Meckel's diverticulum of ileum	5	4	8	1	9
malposition of colon	3	3	4	1	6
absent caudal part of colon	1	0	2	0	2
fistulas of large intestine	1	1	2	0	2
imperforate anus	0	1	1	0	1
Liver					
cysts	2	0	1	1	2
hemangiomas	1	0	1	0	1
localized hemopoiesis	1	0	1	0	1
atresia of cystic duct	1	0	1	0	1
Kidneys					
absence of left	3	0	2	1	3
hypoplasia of left	2	2	4	0	4
hypoplasia of right	1	2	2	0	3
dystopia of right	1	0	1	0	1
horseshoe kidney	1	0	2	0	2
fused on left side	0	1	1	0	1
multiple cysts	12	7	16	3	19
Ureters					
left fissus	0	1	1	0	1
left double	0	1	0	1	1
right double	1	7	5	3	8
bilateral double	0	2	1	1	2
left hydroureter	0	1	1	0	1
bilateral hydroureter	2	2	4	1	5
Urinary bladder					
hypertrophy	1	1	2	1	3
diverticula	0	0	1	0	1
exstrophy	1	0	1	0	1
patent urachus	0	4	2	2	4
Genital organs					
uterovaginal canal	0	2	2	0	2
ovary, dermoid	0	1	1	0	1
external genitalia	2	0	3	0	3
intersexuality			1	0	1
Spleen					
accessory	5	13	12	6	18
cyst	0	1	1	0	1
Erythroblastosis	1	1	2	0	2
Diaphragm	1	1	2	0	2
Abdominal wall					
congenital umbilical hernia	2	0	2	0	2
absence of muscles	0	0	1	0	1
Extremities					
upper	5	1	5	1	6
lower	3	3	7	0	7
Teratoma of coccygeal region	0	1	1	0	1
Multiple amniotic adhesions	1	0	1	0	1
Total number of malformations	101	98	162	40	206
Total number of cases	67	69	96	36	137
Ratio of autopsies	58 :	42	65 :	35	

The numbers in this table suggest an unequal distribution of sex in several groups, although the total numbers are almost equal in both sexes[1]. A preponderance of the male sex was found in the groups of lung and some of the kidney malformations, whereas the female sex predominates in malformations of the heart and spleen as well as in double ureters and patent urachus. Here, as in the distribution of race, only larger groups of cases are mentioned because small numbers are too much subject to chance and therefore are likely to give mislead-

ing results. Concerning the race, a remarkable difference is noticed in the incidence of most of the groups of malformations as well as in the total number. Among 137 cases recorded here 96 were whites and 36 negroes. In this department 65 per cent of the postmortem examinations were performed on whites, so these numbers should not be compared directly. After consideration of this percentage, the relative incidence in whites is 1.44 x that in negroes. The difference is still greater if we consider the number of malformations. Figured in the same way as the above comparison, this number is 2.2 x greater in whites. However, this preponderance of the white race is not equal in all groups. So we find, after again adapting the numbers to the above ratio, that the incidence of double ureters is higher in negroes than in whites and that of heart malformations almost equal. After subtraction of these few groups with even distribution, the preponderance of whites in the remaining types of malformations would be still greater than indicated above.

As the number of cases is not great enough to allow definite conclusions, these facts are given here just to call attention to the question of racial differences in the incidence of malformations. As far as I know, this question has not been brought up yet, although many authors have found considerable differences in the incidence of many diseases between the two races in question, with different results according to the disease considered (see Maes and McFetridge). Data on congenital conditions are only reported incidentally, as Bivings' findings on the occurrence of umbilical hernia in newborns (whites: 8.2 per cent., negroes: 27 per cent.) and the results of Williams and Edmonds concerning the incidence of atypical origin of the great arteries from the arch of the aorta (common origin of the innominate and left carotid arteries more than twice as frequent in negroes. than in whites).

In detail, the tables show that among the anomalies recorded in the nervous system, hydrocephalus and different types of myelocele and meningocele are most common, appearing 12 times each. In nine cases both anomalies are associated with each other, and only three times were they found separately. This coincidence is well known but as yet its cause has not been found. Two of the four cases of anencephaly are also associated with myelocele which is not surprising as both are analogous malformations of different levels of the central nervous system.

The heart anomalies are of many different types and septum defects are the most common. No evidence of fetal inflammatory changes of the valves was obtained. However, no definite decision can be made without extensive histological study.

Most of the anomalies found in the digestive and respiratory tract are typical, some of them belong to rare types, as, e. g., atresia of the esophagus with tracheo-esophageal fistula (cases 803-1938 and 378-1939), the lobe of lung tissue attached to the mediastinum without connection with the bronchial tree ("Nebenlunge" of the German authors, case 1240-1938) etc.

The malformations of urogenital organs are also typical and well known almost without exception. Hypoplasia or absence of one kidney, horseshoe kidney, multiple cysts of the kidneys, hydroureter, and double ureter were found frequently. There is, however, one case of particular interest, showing intersexuality (penis and female internal genital organs) and multiple other anomalies including a tremendous hypertrophy of the bladder wall, up to 12 mm. in a 15-days-old infant (case 26-1939).

The high incidence of accessory spleens (18 cases) is well known. The malformations of the abdominal wall include one case of absence of muscles associated with the above mentioned intersexuality, and two cases of amniotic umbilical hernia, one of them occurring with exstrophy of the bladder (case 1046-1938). Among the remaining anomalies only the case of amniotic adhesions (case 132-1939) is worth mentioning. It demonstrates strikingly the power exerted on the fetus by adhesions to the placenta, resulting in extensive distortion of the body; in our case the face especially.

Table 1 once more illustrates the high incidence of multiple anomalies of apparently independent origin. Among the 137 cases an association of two independent anomalies was found 20 times, three indepedent malformations were found in six cases, five and six anomalies once each. Of course, the term *independent* re-

[1]58% of the bodies examined were male.

fers only to the formal genesis. There are certainly other factors, perhaps genetic, which account for the accumulation of malformations in so many cases. It should always be borne in mind that in an individual with one malformation there are often others associated. Again, there is a difference between whites and negroes, the average number of malformations found in the 137 cases considered here being 1.7 in whites and 1.1 in negroes, i. e., about 55 per cent. greater in the former.

Congenital malformations have an exceptional position among the abnormal conditions in the organism. We are faced with them at birth or later without having a chance to protect the individual against them. Many of them develop at a time when the affected organ is not yet in full function and disturbances develop after birth when the maldeveloped organ is unable to fulfill its purpose. Therefore one must always be on the lookout for malformations although they are comparatively rare.

The practical importance of the malformations as recorded here varies to a very high degree. Many of them are known to be fatal, others to be innocent, but there is a large number of cases where it is impossible to know definitely the prognosis even when the abnormal condition has been diagnosed. Unilateral hypoplastic kidney with a normal kidney on the other side may, e. g., be borne without any trouble throughout a normal lifetime, but may cause death in other cases by predisposing the bearer to nephritis or renal insufficiency.

Thus teratology proves to be an important and interesting part of pathology. Even at the autopsy table we are puzzled many times by new and unexpected findings of developmental pathology. The present report shows the high incidence of related cases found even with the limited opportunities of the routine post-mortem examination. A remarkable difference in the incidence of many malformations was found between the white and negro race.

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RECENT ADVANCES IN GYNECOLOGIC ENDOCRINOLOGY

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During the last two years three new preparations have been introduced into gynecologic therapy. Two of them, the male hormone testosterone propionate and the gonadotropic hormone obtained from pregnant mares' serum are true hormones, whereas the third preparation, stilbestrol, is a synthetically prepared chemical product which, however, possesses numerous properties of the estrogens.

TESTOSTERONE PROPIONATE

The male hormone testosterone or its derivative testosterone propionate, resembles progesterone, the corpus luteum hormone in many ways. It is capable of inducing progestational-like proliferation of the endometrium in rabbits and rats, it will inhibit uterine contractions induced by estrogen, maintain pregnancy following the excision of the ovaries, delay parturition in the normal pregnant rat, neutralize vaginal and uterine responses to estrin and completely suppress spontaneous estrus cycles in rats and mice. By administering testosterone propionate to monkeys, Zuckerman[1], induced ovarian atrophy and endometrial involution and he suppressed menstruation throughout the duration of treatment. In normal women similar results have been obtained. We[2] have found that testosterone propionate inhibits ovarian activity with the suppression of uterine bleeding and involution of the accessory organs, including the breasts, uterus and vaginal mucosa. Fibromyomas which are under the influence of the ovary, diminish in size. However, these anatomical changes persist only as long as the patient is under the influence of the androgen.

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The mechanism by which testosterone propionate produces these alterations is not through its progestational action, because changes typical of progesterone have not been demonstrated in the endometrium. This does not matter because there is almost certainly no definite correlation between excessive bleeding and histological changes of the endometrium. Most likely also, there is no specific endometrial pattern in dysmenorrhea. We must look elsewhere than the endometrium for the etiology of most ovarian dysfunctions and the explanation for the therapeutic responses in these conditions. It may be that testosterone propionate inhibits the pituitary follicle-stimulating hormone resulting in ovarian atrophy and subsequent uterine involution due to lack of estrin. Abarbanel[3] offers a physiodynamic explanation of the modus operandi by which excessive bleeding is controlled by testosterone propionate. This interpretation is based upon the response of the myometrial elements to testosterone propionate. First, this hormone inhibits rhythmic, intermittent uterine contractions, thereby eliminating the pumping action of these movements. As a result, the volume of blood flowing to and thus through the uterus definitely decreases. Second, the direct stimulative, squeezing effect of testosterone upon the myometrial elements brings about a functional constriction of the myometrial blood vessels. The sum total of the twofold effects results in a decided reduction in the flow of blood to the endometrium. Consequently the amount of uterine bleeding is very considerably diminished.

Male hormone therapy has been found to be of definite help in a few gynecological disturbances. These are excessive uterine bleeding, dysmenorrhea, painful breasts premenstrual tension and memopausal disturbances.

For the control of profuse uterine bleeding, large amounts of testosterone propionate are necessary because in order to stop the profuse flow *of blood, ovarian activity must be suppressed* completely. Generally to check excessive uterine *bleeding, between 300 and 500 mg. of this hor*mone must be given hypodermically in divided doses three times a week over a period of a month. When the hormone is injected subcutaneously instead of intramuscularly, smaller doses may be satisfactory. I have seen cases where sufficient testosterone was administered to prevent ovulation as demonstrated by endometrial biopsies, and yet the menses were not diminished or delayed significantly. It appears that ovulation can be inhibited with about one-half the amount of testosterone propionate necessary to suppress the menses (anovular menstruation).

The relief from dysmenorrhea produced by testosterone propionate is due to its inhibiting effect on uterine muscle contractions or to the suppression of ovulation. Due to this action, some women with dysmenorrhea will be relieved of their pain when given between 90 and 250 mg. of the hormone in six divided doses during the last two weeks of the menstrual cycle even though the menstrual flow is not disturbed. In some cases, however, this amount of testosterone propionate will not suffice and about 75 to 100 mg. will have to be given every week throughout the month to suppress the menses in order to alleviate the dysmenorrhea.

The beneficial effects of testosterone propionate in cases of painful breasts may be explained on the basis of a temporary menopause. However, suppression of the menses is not essential in order to obtain the desired results. Since complete ovarian suppression is not necessary to relieve painful breasts, in some cases it is possible that the direct antagonism of estrogen by the male hormone plays a role in the treatment of mastopathies. In cases of painful breasts between 10 and 25 mg. should be given three times a week during each of the two weeks preceding the menstrual flow.

In some cases of distressing premenstrual tension, 10 to 25 mg. of testosterone propionate administered three times a week during the last two weeks of the cycle relieves these annoying symptoms. Recently my associate, Dr. Freed, and I[4] have encountered striking success with ammonium chloride in women with premenstrual distress. When 30 grains of this drug are administered during each day of the second two weeks *of the menstrual cycle, many women who have* headaches, nausea, bloating of the abdomen, emo*tional disturbances and edema a few days before* the onset of the menstrual bleeding, experience dramatic relief. While the ammonium chloride is being taken the patient should eliminate salt and sodium bicarbonate from her food.

Generally the benefits derived from testosterone propionate cease shortly after the use of the hormone is discontinued. Hence, physicians

must bear in mind that this form of therapy is only temporary. However, in some cases, the improvement persists for a long time following cessation of the injections. We have no satisfactory explanation for this phenomenon.

A word of caution in the use of male hormones in women is important. These hormones, if given in large amounts may produce symptoms of virilism, such as growth of hair, especially on the upper lip and chin, a lowered pitch in the voice and a slight enlargement of the clitoris. Furthermore, a few women gain weight and develop an acneform eruption (Greenhill and Freed)[5]. However, practically all of these disagreeable signs disappear shortly after the injections are stopped.

GONADOTROPIC HORMONE FROM THE SERUM OF PREGNANT MARES

In 1926 P. E. Smith[6] and Zondek[7] independently proved that the anterior pituitary gland provides the physiologic stimulus necessary to regulate the growth and function of the reproductive glands of both males and females. Since that time, numerous efforts have been made to prepare a product which will reproduce in humans the gonadotropic effects of the intact anterior pituitary gland. The first efforts were naturally directed toward extracts from the pituitary glands of animals but thus far these extracts have not been satisfactory for clinical use. A second source of gonadotropic hormones was found in 1928 by Aschheim and Zondek[8] in pregnancy urine. The origin of this hormone proved to be the placenta and the hormone can be obtained in large amounts from the urine of pregnant animals and humans. Much effort has been expended in studying the effects of these chorionic gonadotropic hormones and it has been found that they likewise do not act exactly like the gonadotropic hormones of the intact anterior pituitary gland.

A third source of gonadotropic hormone was found in 1930 by Cole and Hart[9] in the blood serum of pregnant mares. In animals this hormone produces effects similar to those which result from extracts of the anterior pituitary gland. Thus it is capable of stimulating the germinative epithelium of the ovaries and testes in laboratory animals, it can induce ovarian growth in primates and it can produce fertile ovulations in rats, cows, sows and other animals. Hartman[10] was able to bring about ovulation in seven per cent. of 104 monkeys. Davis and Koff[11], Siegler and Fein[12], and Gray[13] have been able to produce ovulation in humans by means of pregnant mares' serum gonadotropic hormone. However, the chances of producing ovulation in women who do not ovulate spontaneously are at present, uncertain. The controlled experiments of Hartman on monkeys were far from promising. Many monkeys were refractory to the hormone and in 16 monkeys, overstimulation of the ovaries resulted. However, the deleterious action of the extracts was only temporary, for the recovery was prompt and complete. Growth of the follicles was usually produced at too rapid a rate. Furthermore, even when ovulation took place, Hartman found indications that "the production of ovulation does not guarantee an endocrine condition favorable to the implantation of a fertilized ovum, for in some cases, the menses occurred too soon after ovulation." The injections were "successful" in producing ovulation in only seven per cent. of the cases.

When this hormone from pregnant mares' serum is effective its action is very rapid. In the rodent and in the primate, follicle maturation, ovulation and corpus luteum formation can occur within 24 hours.

In the human female, the hormone obtained from pregnant mares' serum has been recommended for functional uterine bleeding, amenorrhea, sterility and failure of ovulation. Thus far the controlled clinical results obtained in these gynecological disturbances have not been very satisfactory. The effects produced in the experimental animals have not been duplicated in human beings. Furthermore, since pregnant mares' serum is a protein derivative, care must be exercised in the administration of this potent hormone. Before using it, a small amount should be injected intradermally or placed on the conjunctiva of the eye. It is advisable to wait 30 minutes to see if there is any reaction to the horse serum before injecting a full dose.

In view of the fact that clinical results are very uncertain, that as yet there is no agreement on the dosage of this hormone, and that there is a possibility of serious reaction from the horse serum, it will be better for the general practitioner to leave it to the specialists to continue

experimenting with this substance clinically.

If a practitioner desires to use pregnant mares' serum gonadotropic hormone, in cases of amenorrhea, sterility or functional uterine bleeding, he should first perform an endometrial biopsy to determine whether or not the patient is ovulating. This is readily accomplished in the office by means of a tiny curet or a special hollow, suction curet. The best time to obtain the specimen of endometrium is the first day of menstruation or a day or two before it should begin. The tissue obtained in this manner must be studied microscopically. If it reveals that a secretory or progravid endometrium is present, this is evidence that the woman ovulated. It is generally assumed that women who menstruate with the usual degree of regularity and in whom one or more biopsies reveal secretory endometrium, ovulate every month. Such women do not require gonadotropic hormone. In fact, this hormone may do harm by producing excessive follicle stimulation, but this is temporary. If on the other hand, endometrial biopsy performed just before or on the first day of the menses shows a proliferative type of endometrium, this is evidence that ovulation failed to take place. If repeated biopsies prove the absence of a secretory endometrium, mares' serum gonadotropic hormone may be administered in the hope that it will stimulate ovulation. This hormone should only be given when a patient does not ovulate.

STILBESTROL

In 1938, Dodds, Goldberg, Lawson and Robinson[14] reported that they had synthesized a new product, diethylstilbestrol, which possessed estrogenic properties. Dodds, Lawson and Noble[15] found that this substance produced remarkable estrogen effects when given by mouth. In animals this drug is almost as effective when given orally as by the hypodermic route because it loses little of its activity when taken by mouth. It is two and a half times as effective as estrone when given by injection and about 15 to 20 times superior to the natural estrogens when given by mouth. Stilbestrol is not only superior to the natural estrogens because it is so effective when given orally, but it costs very little to make.

The indications for the use of stilbestrol are almost identical with those for the employment of the natural estrogens. These conditions include menopausal disturbances, gonorrheal vulvovaginitis, senile vaginitis, and pruritus vulvae. The desired effects can be obtained by the oral route alone in doses of 1 and 2 mg. daily until the desired result is obtained. One milligram is equivalent to about 20,000 international units of estrone.

One of the most spectacular effects of stilbestrol may be observed in puerperal women in whom the supply of milk is to be prevented or suppressed. When 5 mg. of stilbestrol are given on each of the first three days after delivery, lactation will be prevented without any discomfort. If 5 mg. are given on each of two or three days after the flow of milk has been established, the supply of milk will diminish rapidly and painlessly even without the use of a breast binder or restriction of fluids. A remarkable fact is the almost complete absence of toxic effects in puerperal women who take stilbestrol.

Unfortunately, not all women can tolerate stilbestrol. A varying percentage of women experience nausea, vomiting and other disagreeable side-effects. This is particularly true of women who take large doses but some women experience these disturbances after only one or two mg. Puerperal women are almost entirely free from these toxic symptoms. Furthermore, as with the use of the natural estrogens, uterine bleeding may be produced in women past the menopause, but stilbestrol not infrequently brings about uterine bleeding even while the drug is being administered. However, this is seldom serious.

Shorr, Robinson and Papanicolaou[16] observed toxic effects in 80 per cent. of 44 women. These effects consisted of nausea, vomiting, abdominal distress, anorexia, diarrhea, lassitude, paresthesias, vertigo, thirst and cutaneous rashes. These authors believe the toxic effects are largely central in origin, following injection as well as oral administration. The incidence of toxic symptoms in Shorr's series was much higher than that reported by other authors and in the series of Dr. Freed and myself.

Contrary to the demonstration of liver damage in animals produced by stilbestrol, no such damage can be detected in women. Freed and Soskin[17] found that almost as many normal women had retention of bromsulphthalein as women

who had been given stilbestrol. Nevertheless, until we know more about stilbestrol we should be cautious in using this drug. Because the question of toxicity has not yet definitely been settled, the United States government has not granted any permits for the sale of stilbestrol. Therefore, it is not available commercially at the present time.

ROUTES FOR ADMINISTERING ESTROGENS

Estrogens are generally administered hypodermically or by mouth. In a few instances such as gonorrheal vulvovaginitis, the estrogens are used in the form of vaginal suppositories and occasionally they are given as rectal suppositories. There is no doubt that estrogens have a distinctly local action. MacBryde[18] demonstrated that estrogens can be absorbed through the skin of women directly into the breast tissue and by this route can produce their characteristic stimulation of mammary growth. The practical application of this form of treatment has little significance. However, in some cases of pruritus vulvae and kraurosis vulvae the local application of estrogens is distinctly helpful. Even when estrogen is applied to the skin in the form of an ointment, a sufficient amount of it can be absorbed to produce an estrogenic effect on the epithelium of the vaginal mucous membrane (Salmon)[19]. I have recently been using an ointment of stilbestrol and this promises to be helpful in the treatment of pruritus vulvae.

Another route for the administration of the estrogens is the subcutaneous implantation of pellets of estrogens. When pellets are injected through a wide-bore needle or surgically implanted under the skin, there is a very slow absorption over a period of months. During this time, therefore, the patient need not take any estrogens by mouth or by the hypodermic route because the subcutaneous implants suffice. This route is particularly valuable for young women in whom ovarian function has been eliminated by operation or radiation and in older women who are having a prolonged and distressing menopause. Not only may estrone be implanted subcutaneously but also stilbestrol (and the male hormone, testosterone propionate). These "artificial ovaries" may be left in place for many months during which time there is a slow absorption, sufficient to relieve the patient's symptoms.

SUMMARY

Three new preparations have been introduced into gynecologic therapy during the past two years. These are: (1) the male hormone, testosterone propionate, (2) the gonadotropic hormone derived from pregnant mares' serum and (3) stilbestrol. The first two are hormones but stilbestrol is a chemically-prepared product.

Testosterone propionate is useful in some cases of excessive uterine bleeding, dysmenorrhea, painful breasts premenstrual tension and menopausal disturbances. This hormone must be used with caution in women because of the possibility of producing signs of virilism. These signs however, are temporary.

The gonadotropic hormone derived from mares' serum is theoretically indicated in women who do not ovulate. Before using this hormone it is necessary to perform endometrial biopsies to prove the absence of ovulation. Since the clinical use of this hormone is still in the experimental stage, general practitioners will do well to wait for further controlled clinical reports from specialists before using this hormone.

Stilbestrol is a synthetic chemical product which possesses numerous properties of the estrogens. It may, therefore, be used to relieve menopausal disturbances, gonorrheal vulvovaginitis, senile vaginitis, and pruritus vulvae. It is cheap to manufacture and is highly effective when taken by mouth. However, because of its possible toxic effects it is not yet available commercially.

In addition to the customary routes of administering hormones, namely by the hypodermic route, by mouth, through the vagina and rectum, we now are applying hormones through the skin and under the skin. The subcutaneous implantation of pellets of hormone preparations or "artificial ovaries" will prove most useful for women who presumably will have distressing menopausal symptoms over a long period of time.

In closing I should like to emphasize that great caution must be exercised not only in the use of the new endocrine preparations but also in the employment of the numerous hormones which are now being used superabundantly and unscientifically by many practitioners of medicine.

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PRURITUS*

A Review of Its Motivation

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Pruritus is such a common sensation that ordinarily one would assume that all phases concerning its production are known and its delineation a tabulation of facts. Unfortunately, this is not true. There are wide gaps in our knowledge of the basic processes which enter into the phenomenon called pruritus. Concerning some of these, we must simply admit ignorance; for others, we will relate differences of opinion and, for a few, we can record exact information.

Pruritus or itching may be defined as a cutaneous subjective symptom producing a desire to scratch. It is fundamentally not a disease entity but consists of subjective sensations of itching, burning, tingling, tickling, prickling, crawling and smarting which causes the sufferer to rub, press, scratch and otherwise irritate the affected skin. Primarily pruritus is unaccompanied by objective lesional changes.

Many interesting phenomena enter into the production and conduction of the itch stimulus. Of necessity, these must be discussed separately.

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1. SENSORY NERVE STIMULATION

Pruritus is a phenomenon which is activated by stimulation of cutaneous nerves. Epidermal nerves arise from a plexus of medullated nerves in the corium to extend as non-medullated fibers between the prickle-cells to form the interepithelial plexus. They end either in minute swellings between the cells or pass into the cells and terminate in swellings applied to the nucleuses. These fibers are sensitive to touch-impressions and to common sensations as heat, cold and pain. Non-medullated nerves also furnish fibers to the skin to supply chiefly the arrector muscles, sweat coils and blood vessels.

Pruritic impulses are produced by chemical changes in these nerve swellings. These chemical changes in turn must be caused by alterations in the epithelial cells or in the intercellular fluids. We do not know how a nerve impulse is started or what changes occur in the environment of a nerve terminal to produce its activation towards the sensation of pruritus.

Our ignorance of these basic biochemical processes causes the chief obstacle in our complete understanding of the mechanism of pruritus. The problem is not insurmountable, however, as the developing information concerning human autonomic pharmacology will probably have a direct application. Chemical changes must occur comparable to the production by reacting cells and tissues to cholenergic and adrenergic substances and the relation of various drugs to these substances which permits a chemical explanation for the actions of the sympathetic and parasympathetic systems.

2. PERIPHERAL NERVE MECHANISM

It is generally accepted that itching arises through a special mode of activity of the pain-apparatus and is produced by subliminal stimulation of the nerve endings for pain. When certain thresholds of intensity are exceeded, the specific character of itching becomes a pain sensation. However, this does not mean that itching sensation is the same as mild pain because the weakest painful sensation can be distinguished from itching.

Special senses as sight, touch, temperature, taste and smell are related to well-defined specific physical, mechanical or chemical stimuli. Itch-

ing seems to be activated by various nonspecific stimuli. This would indicate that, in addition to peripheral mechanism, pruritus is modified by various factors including a characteristic central mode of action.

3. RELATIONSHIP OF TOUCH MECHANISM WITH PRURITUS

The peripheral pain mechanism does not seem to be the exclusive peripheral nerve factor in the activation of pruritus. When a light hair is drawn acros the skin to produce tickling, the superficial pressure receptors are stimulated. These afferent impulses travel to the brain in the identical pathways for painful impulses. In syringomyelia, itching may be present, although modified, when the perception of pain and temperature is absent but that of touch is still intact. Itching is absent in all cases when pain, temperature and touch is lost. For the development of the complete itching sensation, the mechanism of both pain and touch must be intact.

It is interesting to recall that the cornea and visceral organs register pain but not touch. They, also, do not register itching.

4. RECEPTIVE CENTERS FOR ITCHING IN THE BRAIN

In cortical disturbances, itching is not disturbed even when pain, touch and temperature are markedly impaired. Pharmacodynamic investigations show that itching is not reduced by substances acting on the cortex, as paraldehyde and bromides. A therapeutic decrease is also not experienced by moderate doses of morphine or the usual cortical sedatives. Pain is modified, however, by small doses of barbiturates which have been shown to act on the brain stem and midbrain. Receptive centers for itching are, therefore, not located in the cortex.

Receptive centers are not located in the internal capsule because in capsular hemiplegia itching may be diminished or absent in the areas of sensory disturbances. Central itching in the sense of itch paresthesia is retained in cases of spinal and midbrain damage.

Brain lesions which produce diminished or complete loss of objective perception of pain, touch and temperature but retain central pain also show a preservation of the itch sensation. This is true for pronounced thalamic disease. The association of central pain with the retention of itch sensation seems to indicate the thalamus as the central origin of itching sensations.

5. REFLEX SECONDARY ITCH SENSATIONS

As with pain, reflex secondary itch sensations may occur at a considerable distance from the site of the stimulus. These secondary sensations are usually simultaneous with the primary sensation but may be delayed. They are generally unilateral and higher up. Pain, and therefore itch sensations, travel over short-chain first-order neurons that end unilaterally shortly after entering the spinal cord near the level of entry. Reflexes are here established with motor cells to produce immediate, protective defensive muscular reactions. Synapses are also established at the level of entrance with still unilateral second-order neurons to establish connection with other sensory cells farther centripetally which in turn give rise to distant secondary itch sensations and scratch impulses. Long third-order neurons which carry itch sensations to the brain and consciousness are usually contralateral and ascend to the brain through the spinotectal and spinalthalamic tracts.

It is not known for certain but secondary itch sensations may also reflexively arise within the central nervous system. Segmentary itching occurs in tabes.

A consideration of the phenomenon of reflex itching and resulting reflex eczema is important clinically in the study of the relationship on many pruritic dermatoses and chronic appendicitis, prostatitis, cholicystitis, etc.

6. VEGETATIVE NERVOUS SYSTEM

An ordinary assumption would indicate that the vegetative nervous system is an integral part of pruritus. At the site of itching, there is often local vegetative reactions as vasoconstriction and goose-skin and, also, sometimes vasodilation with or without urticaria. Pruritus and itching dermatoses are often accompanied by vegetative nervous imbalance chiefly of vagatonia. However, vegetative nervous disturbances, as amylnitrate erythema, blushing, adrenalin anemia, never, in themselves, cause itching. Nor, do either vasoconstriction or vasodilatation prevent it. Vasomotor phenomena that may accompany

pruritus are autonomic reflexes from the sensory stimulation and are not responsible for itching. Independent factors, which may affect the vegetative system, may also affect pruritus.

7. RELATIONSHIP BETWEEN VISIBLE CUTANEOUS CHANGE AND PRURITUS

Visible cutaneous changes, as urticaria, prurigo nodules, eczematous vesicles, lichen papules do not cause itching. In wheals produced by external irritants, for example insect bites, nettle, mechanical stimuli in factitial urticaria, itching always is felt before the appearance of the wheal. When the wheal has reached its maximum, the itching has subsided or disappeared. Wheals produced endogenously behave similarly. Pressure caused by the fluid exudate of wheals and other lesions does not activate the itch stimulus because there is no itching when indifferent fluids are introduced into the skin. In acute eczema, the itching is most intense during the development of the vesicles and abates when the edema of the epidermis is at its height. Prurigo nodules and lichen planus papules are frequently preceded by itching.

Itching is produced when substances are formed which irritate the nerve endings. These same substances proceed to activate inflammatory changes with the production of edema and objective lesions. When the lesions have been fully developed, the edema has diluted the itch-exciting substance causing diminution or cessation of the pruritus. It is the noxae that cause itching; not the resulting skin lesions.

8. VARIATION IN ITCH SENSITIVENESS

The fact that cutaneous lesions do not cause itching, however, does not mean that they do not affect itching. Variations in degree of itching may be influenced by many factors.

Clinically demonstrable changes can raise the itch excitability of affected areas. On eczematous skins, the itch stimulus is more intense, of longer duration and more widespread than on normal skins. Furthermore, inadequate stimuli, as the weakest needle-prick and subliminal touch-stimuli, which do not normally cause itching produce itching on eczematous skins. Ordinary stimuli of our environment usually passing unnoticed on normal skins, produce itching in abnormal skins. It is a common experience that itch excitability is often raised in areas affected by urticaria or in wheals produced by insect bites long after the wheal has disappeared. The consequential scratching may or may not produce new wheals. All itching dermatoses exhibit this phenomena.

Variations in itch sensitiveness may also be psychically influenced. A phlegmatic individual usually shows a definite resistance to itch stimuli whereas a high-strung, excitable, easily-irritated person is frequently affected by stimuli far below that normally required to produce itching.

9. EFFECTS OF ENDOGENOUS NOXAE ON PRURITUS

Pruritus caused by endogenous chemical noxae is probably closely related to the same mechanism producing allergic manifestations. In fact, itching and raised itch excitability are characteristics of cutaneous allergic states. Possibly the changes in the nerve endings resulting in the pruritus are caused by locally formed products of sensitization reactions. This cannot be ascribed to the setting free of histamine or cholenergic chemicals as the injection of histamine and acetylcholine in the epidermis does not produce itching. As before stated, the ultimate and complete elucidation of pruritus will not be accomplished until further knowledge is determined concerning the exact processes of sensitization reactions and the interplay of the antigen-antibody mechanism in the body economy. Pruritus may be a component of these phenomena.

Endogenous noxae may be the result of malignant disease of internal organs. Itching commonly accompanies and frequently is the first diagnostic sign of internal cancer. It may be an expression of early reaction between skin tissue and tumor cells. Early itching is also seen in granuloma fungoides, leukemia and other blastomas.

Local pruritus often has a general cause. Pruritus involving the lower part of the abdomen is known in chronic appendicitis and is relieved by appendectomy. This may be produced by reflex nerve stimulation but may also be due to production of toxic substances. Persistent vulval pruritus not influenced by treatment sometimes completely disappears after cholecystectomy. Noxae produced by jaundice, diabetes mellitus, chronic interstitial nephritis, focal in-

fection, intestinal toxemia, drugs and articles of diet commonly cause pruritus.

Senile pruritus does not seem to be produced by chemical changes but probably follows an altered threshold of itch stimuli due to senile atrophy of cutaneous structures.

10. MENTAL INFLUENCES

Psychology has a definite bearing on the problem of pruritus. Conflicts that are not made conscious and thus rationally disposed of, are repressed into the unconscious. These energies are "bottled-up" and lead to abnormal manifestations in the mind (psychoneuroses) or affect disturbances in the body (conversions). Particular organs may be chosen for these conversion affections and resulting symptoms are termed psychogenic. The skin is a common conversion organ; in fact, it is perhaps the most common since it is the one of which the mind is most conscious. Physical energies have a close reciprocal connection with the vegetative system which has been grouped to include the autonomic nervous system and the hormonal apparatus.

Pruritus is frequently a phenomena of sensory neuroses. It may be purely psychogenic and independent of specific excitement of peripheral end-organs. For instance, when a finger is anesthetized, itching suggested by hypnosis will be just as intense in the anesthetized finger as in the opposite untreated finger.

Tension of concentration produces itching points in the skin probably by preparing the stage for pruriginous stimuli. The itching does not occur spontaneously but results in infinitesimal sensations as changes in temperature, movements of air, pressure of clothes and emotional waves acting on an already prepared skin. This is a common experience as when standing still on parade or in a photographic studio, boredom, fatigue, emotional tension, etc. At first the impulse to scratch can be abolished by conscious refusal. By repetition or when the skin has been pathologically altered, as in eczema, these impulses cannot be consciously resisted.

There is hardly any sensation of the skin that cannot under certain circumstances result from sexual neuroses. Acute itching attacks may resemble sexual orgasm. Itching is closely associated with sexual voluptuous sensation and at times may be a substitute for unsatisfactory or absent coitus.

ADDENDUM

An attempt to correlate these factors which enter into the motivation of pruritus is impossible in the space and time allotted to this paper. Neither can an attempt be made to transfer this basic information to the symptomatology and therapeutics of pruritus. However, to indicate a clinical adaptation, an outline of those conditions which may cause and be accompanied by pruritus seems desirable. This outline is copied directly from Goldsmith[2].

I Dermatoses in which pruritus is of diagnostic importance.

- A. Pediculosis
- B. Scabies
- C. Grain-itch
- D. Erythema pernio (chillblains)
  - 1. Chillblain lupus (Hutchinson)
  - 2. Lupus pernio
  - 3. Erythrocyanosis
- E. Papular urticaria
- F. Prurigo
  - 1. Prurigo mitis
  - 2. Prurigo nodularis
- G. Neurodermatitis (Brocq) (Lichen simplex chronicus)
  - 1. Circumscribed
  - 2. Disseminated
- H. Fox-Fordyce Disease
- I. Dermatitis herpetiformis (Duhring)
- J. Granuloma fungoides
- K. Hodgkin's disease and leukemia

II Pruritus without or with preceding visible changes

- A. External causes
  Baths, underclothing, changes in temperature, irritating dusts or vapors
- B. Metabolic causes
  - 1. Diabetes mellitus
  - 2. Jaundice
  - 3. Chronic interstitial nephritis
  - 4. Gout
- C. Focal Infections
  - 1. Cholecystitis
  - 2. Appendicitis
  - 3. Teeth, tonsils, sinuses
  - 4. Furunculosis, dermatomycosis, etc.
- D. Intestinal Toxemia

Abnormal flora, e.g., deficiency of B. Coli, excess of streptococci, nonlactose fermenters, etc.

E. Drugs and articles of diet
F. Allergy
G. Granuloma fungoides, Hodgkin's disease
H. Malignant disease
I. Psycogenic influences
J. Vulval and anal pruritus
K. Senile skin

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CHOICE AND DOSAGE OF CHEMOTHERAPEUTIC AGENTS FOR BACTERIAL INFECTIONS

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In the four years that have elapsed since sulfanilamide was introduced clinically as an effective therapeutic agent, there have evolved certain clinical concepts which allow us now to speak of what might be called principles of chemotherapy. Despite the fact that its mode of action is as yet not known; despite the fact that new experimental evidences of its effectiveness or ineffectiveness against different organisms is still accumulating; desipte the fact that many new related compounds are constantly being prepared and tried; and even despite the fact that with added experience our notions concerning its rational use are constantly changing, we can at this time state these principles as they appear now and employ them in our present use of the drugs and in our future evaluation of similar or related drugs. A discussion of these principles should consider the practical application of them to the following questions: When should a drug be given; which drug should be given; how should it be given; what should be expected from it both in terms of clinical response and toxicity from the drug?

When Should a Drug be Used? In considering the acute bacterial infections, this should be rather easily answered by saying that one should be used when there is a known or suspected infection due to one or several organisms against which the drugs are known to be effective, but even this would not go unchallenged. The question often is raised as to whether it is wise to give sulfanilamide in such an infection as an acute follicular tonsillitis in a child, which is so often self-limited and benign. Our feeling would be that in this, as in similar infections, in spite of their usual mildness, complications do develop frequently enough that the drug should be given early and in adequate dosages. It has been apparent to everyone that smaller dosages may suffice in these milder infections, but our preference is decidedly for the full dosage administered as early as possible and until the infection is well under control and then gradually diminishing dosages until the infection is eradicated. An interesting possibility suggests itself here. It is the general feeling of people working experimentally with the sulfanilamide group of drugs that their effect varies directly with the concentration of the drug and inversely with the number of organisms present. This would suggest the value of administering sulfanilamide prophylactically, for instance, to the intimate contacts of a child who has an acute hemolytic streptococcus infection of the upper respiratory tract. Clinically, protection against or abortion of such infections, particularly scarlet fever, by such a procedure has been suggested in the literature. However, the evaluation of this is, of course, extremely difficult. Although there is fairly good agreement concerning when these drugs should be used in the so-called medical conditions, in many cases of which, during the presulfanilamide days, the treatment was in large part symptomatic, in other conditions in which the earlier methods of treatment were more effective, there exists at present a great deal of uncertainty and controversy as to when drug treatment should be used. In general, surgical

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conditions differ not at all in these respects from other conditions except that the logic here is, if anything, more apparent. In many cases a localized infection is present, which, with surgical manipulation, can and is likely to spread, so that preoperative drug therapy is in a sense prophylactic, and is certainly as compared to medical cases, early drug treatment. A final word concerning the question of when should a drug be given should be said about those patients who have a disease which ordinarily would be considered one indicating drug therapy, but who have what some have considered contraindications to drug therapy. The question concerning the use of chemotherapy in the presence of two of these so-called contraindications arises not infrequently. One of these is whether a drug should be used when an acute infection coexists with an acute glomerulonephritis. Our feeling is that sulfanilamide, though not sulfapyridine, can be safely given in this instance, if lower dosages are employed and if the blood concentrations of the drug are carefully checked, since a decreased clearance of sulfanilamide may lead to unusually high blood levels. The second is whether the drugs should be used in an infection in which there is already a leukopenia from some other cause. Great care must be exercised here, but it is our feeling that if a severe infection is present, as is usually the case in such an instance, and it is an infection against which the drugs are known to be effective, that they should be cautiously used.

Which Drug Should be Used? Practically, at the present time, the choice of drugs is still limited to sulfanilamide and sulfapyridine. Sulfathiazol and sulfamethylthiazol are the two newcomers which bid for attention, and these appear to have a very real advantage over sulfapyridine in that they are as effective against at least as many organisms, although the results in staphylococcus infections have been disappointing, and they have materially reduced toxicity, particularly in regard to the amount of nausea and vomiting and the severity of the mental reactions. These have not been sufficiently studied, however, to evaluate them sufficiently. If we limit the choice of drugs then to sulfanilamide and sulfapyridine, we can, at the present time say this: the choice should depend primarily upon their respective effectiveness against the offending organism. In general, we can say that sulfapyridine is of undoubted superiority primarily in infections due to the pneumococcus, and also in those due to the staphylococcus, streptococcus viridans and gonococcus. It is of equal effectiveness in infections due to the beta-hemolytic streptococcus, the meningococcus and the colon bacillus. Besides their effectiveness against the organisms, there are certain other factors which influence the choice of the drug to be used. These apply particularly to those infections due to organisms against which the two drugs are equally effective, and are primarily concerned with differences in their solubility, diffusibility and toxicity. Considering these, sulfanilamide is the drug of choice in such cases. It is more soluble which permits greater ease of parenteral administration, although the sodium salt of sulfapyridine can be employed. Sulfanilamide is more diffusible, which is particularly important wherever there is a localized collection of pus such as in the meninges, the pleural cavity, or an abscess cavity elsewhere, in which, with sulfanilamide, higher drug concentrations in relation to the blood concentration are obtained than with sulfapyridine. This is also of importance in infections of the urinary tract in which the effectiveness of the drug depends upon its concentration in the urine in the free form, and sulfanilamide is more regularly and more completely excreted into the urine and with a larger and more constant proportion in the free form. Finally, the choice of the drug must depend upon differences in their toxicity, and here, too, if the drugs are equally effective against the organism, sulfanilamide is the drug of choice, since sulfapyridine definitely causes more nausea and vomiting than does sulfanilamide, and sulfapyridine may also cause kidney lesions due to the precipitation of the acetyl derivative in the renal tubules and pelves. Before leaving this subject, one very practical point should be made. This is that in an infection in which the offending organism is not immediately or readily obtained and identified, a situation obtaining not infrequently in infants and children, sulfapyridine should probably be considered the drug of choice at the beginning since it has what might be called a wider range of effectiveness. If later, the infection should prove to be due to an organism against which sulfanilamide is

equally effective, and it becomes the drug of choice for one of the other reasons mentioned, a change may be readily made.

How Should the Drug be Used? In considering how the drug should be used, the following points should be made: when should the drug be started; how much should be given; how should it be given; and how long should it be continued. I have mentioned before, that if it is decided to use chemotherapy, it is our feeling that the drug should be started as early in the course of the infection as possible, and in all active infections should be started in full dosages. This full dosage for infants and children for both sulfanilamide and sulfapyridine when given by mouth is calculated on the basis of 0.2 gram per kilogram or 1½ grains per pound per 24 hours which is given in six divided doses. This dosage is continued until the infection is well under control as shown by a fall in temperature and general and local improvement of the patient. At this time, which, in the ordinary infection is from 24 to 48 hours, the dosage is reduced by one-half, and this is continued until all signs of the infection are eradicated. A corresponding dose for adults would be 90 grains during the first period and half this amount following. Following this scheme of dosage, which is somewhat more than usually recommended, particularly for the milder infections, the total intake of the drug is determined by the severity of the infection and the promptness of the response to drug treatment. In the more severe infections, the original dosage is continued for a longer period of time, and in these the parenteral administration of the drugs may be necessary. For this, sulfanilamide is given in a 0.8 per cent. solution, which can be given subcutaneously. The dosage here can be calculated on the basis of two daily injections of 0.1 gram per kilogram or ¾ grain per pound at each clysis. Sulfapyridine itself cannot be given perenterally because of its insolubility, but the soluble sodium salt may be given in the following dosages: it may be given intravenously in the form of a five per cent. solution of which 1 cc. per kilogram body weight is given. This obtains adequate blood concentrations, which, if the administration must be continued by this route could be repeated every eight to 12 hours. We have also been able to obtain and maintain adequate blood concentrations by the rectal administration of sodium sulfapyridine, and recently a report has appeared in which it was given subcutaneously in a solution of 0.3 to 0.7 per cent. subcutaneously with no reaction although the pH of the solution is 10.4. Considerable difficulty is experienced in ascertaining in a given instance when the drug should be stopped. In the milder infections it is probably of less importance and is easier to decide, but in the severe infections, particularly in cases of meningitis, it is our feeling that it should be continued with care until all of the evidence by clinical, bacteriological, and other laboratory means points toward complete eradication of the infection.

Drug Toxicity: The toxic effects of both of these drugs are now quite well known, and have been rightfully thoroughly emphasized and I should like just to mention them. The less serious ones which do not indicate cessation of treatment are frequently seen and include nausea and vomiting, cyanosis, and mental disturbances. The more serious, partly in themselves, but more so because they often herald the occurrence of the most serious are drug fever and rash and except in the most serious infections do demand withdrawal of drug treatment. The most serious are those of disturbances in the red and white blood cells, and hepatitis. The one toxic effect which only sulfapyridine has is the occurrence of urinary concretions composed of the crystals of the acetyl derivative of the drug, which may produce hematuria, and in certain instances has been associated with evidences of nitrogen retention, decreased renal function, and even anuria with death. Keeping patients on the drug well hydrated apparently lessens the incidence of this occurrence. The one toxic effect which I should particularly like to clarify is the cyanosis, which is one of the most frequent observed. It is now agreed by most workers who have investigated the matter that the cyanosis following sulfanilamide administration in most cases is due to the accumulation of methemoglobin, and accordingly is associated with a corresponding reduction in the oxygen carrying capacity of the blood. What should be our attitude toward this very frequent occurrence? We feel that in the ordinary infection treated with the ordinary dosage of the drug the amount of methemoglobin accumulation is not of much consequence. There are, however, certain specific instances in which we feel that it is highly important to get rid of the methemo-

globin, which can be done quite readily and quite easily by the administration of methylene blue either by mouth or intravenously. These instances are as follows: in any infection when the cyanosis and methemoglobin accumulation has become excessive, and we have seen it accumulate to the extent of as much as 40 per cent. of the total pigment which means that 40 per cent. of the hemoglobin is not functioning: particularly important is it to prevent cyanosis in cases of pneumonia where anoxia already exists from another cause and where the patient's color is an important criterion of his condition; and, when sulfanilamide has been used preoperatively it is important to reconvert the methemoglobin to hemoglobin before a general anesthesia is administered. The accumulated methemoglobin can be reconverted to hemoglobin almost completely within the course of one half hour by the intravenous injection of methylene blue. Clinically, the rapid improvement in color of a severely cyanosed patient following the injection is quite dramatic. The dose of methylene blue which we employ for this is one cubic centimeter of a one per cent. solution per 10 kilograms or 22 pounds of body weight up to a maximum of 10 cc. which is given intravenously. Methylene blue by mouth in a dosage of one to three grains every four hours will prevent the occurrence of cyanosis if started simultaneously with the drug or if given following a single intravenous injection.

Much has been learned concerning these drugs in a comparatively short period of time. Infinitely more is to be learned, but the intelligent use of them throughout will depend upon a thorough knowledge of their effectiveness against infection and no less so of their toxicity to the patients.

DIAGNOSIS AND TREATMENT OF COMMON PERIPHERAL VASCULAR DISEASE OF THE LOWER EXTREMITIES

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Interest and progress in the treatment of peripheral vascular disease have increased markedly in recent years. The value of early diagnosis has become apparent and cannot be emphasized too strongly. Preventive medicine may reach great heights in this disabling and too often fatal condition.

The purpose of this paper is to deal with the common types of peripheral vascular disease as seen by the general practitioner and in the general hospital. The most common and important conditions fall under two heads, i.e., arteriosclerosis obliterans, both diabetic and non-diabetic, and thrombo-angiitis obliterans or Buerger's disease. These two conditions are classified as organic obstructive diseases in contrast to those conditions due to vasomotor imbalance, such as Raynaud's disease, erythromelalgia, etc. For the sake of brevity these vasomotor conditions will not be considered.

One other very common condition may also be included, as it is often a complication of either of the above conditions, and at times occurs independently of arterial disease. This condition is acute embolic occlusion of peripheral vessels.

The diagnosis of peripheral vascular disease is based on definite symptoms and signs and depends primarily upon a careful history and physical examination. Numerous adjuncts to diagnosis will be discussed, but these should always remain so and never become substitutes.

Symptomatically, organic obliterative diseases of the lower extremities are very similar. In general, all the symptoms are due to curtailment of blood supply. The most important and most frequent symptom is pain or modifications of pain. Typically, this occurs during exercise, is relieved by rest and is the age-old syndrome known as "intermittent claudication." One must emphasize that this syndrome is a comparatively late symptom of the disease, found, as a rule, only in advanced cases, and can be usually considered pathognomonic of arterial obstruction.

Early in arterial disease the subjective symptoms vary a great deal. Numbness in the toes, a feeling of tiredness and weakness in feet, ankles and calves, may be all the patient experiences for a long time. Subjective coldness may be the only and most prominent symptom for some time. This may be present at all times, or, as is frequently the case, be noticed only at night, even in warm weather. Cessation of perspiration in the affected extremity may be the only symptom noticed at first.

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As the disease advances, pain during exercise, relieved by rest, enters the picture. The amount of exercise necessary to produce this symptom gradually decreases and soon the patient begins to complain of pain at rest. Rest pain is of a different nature than that occurring with exercise. It is very severe, described most often as boring or shooting in nature, not unlike the lightning pains of tabes dorsalis. Rest pain occurs often only at night, depriving the patient of relaxation and sleep.

Lastly we have the severe agonizing pain seen in cases with ulceration and gangrene.

The physical examination of the extremities contributes most to the true evalution as to the amount of circulatory deficiency and is concerned for the most part with the appearance, the temperature and palpation of the peripheral vessels.

The appearance of the extremities is very important and inspection should be thorough. Both extremities should be bare during the examination and should be compared. The skin in many instances is normal; though, if sufficient disturbance of the nutrition has occurred, it may be dry, thin and shiny. At times, muscular atrophy is present sufficient to be detected without measurement. There may be loss of hair on the dorsum of the feet and toes, and at times changes in the toe nails. Color changes occur and vary according to the extent of the circulatory insufficiency. Oftentimes, even in cases with moderate involvement, there may be no change in color in the horizontal position, while a definite rubor develops on dependent position. This rubor varies from an increase of the normal pink color to deep dusky red, tinged at times with a cyanotic hue. In advanced cases, intense cyanosis may persist even when the horizontal position is assumed. Cyanosis persisting after digital pressure gives as a rule a very poor prognosis as to chances of resuscitation.

In advanced cases, the foot may be very pale, almost cadaveric in appearance. Ulceration and gangrene occur in late cases and may be either "wet" or "dry."

Ischemia is perhaps the most important single objective sign in circulatory disturbances of the extremities. At times this ischemia is present in the horizontal position; if not, then will follow elevation of the extremity and forms the basis for a simple test as follows: both extremities are elevated to 45 degrees and the patient rapidly flexes and extends the feet. Normally there is little if any deviation from the light pink color, while in cases of circulatory deficiency a more or less marked plantar ischemia occurs. This becomes very obvious if one extremity is normal, thereby giving a good comparison. The degree of involvement may be roughly gauged by the time element in appearance of the ischemia.

Surface temperature changes are important and at times sufficiently marked to be detected by the examiner's palm. The palm should be passed from above downward along the extremities, noticing any sudden change or gradual change, and the two extremities compared. Changes as slight as one degree may be detected by some trained hands. A difference in the levels of temperature changes in one extremity as compared with the other is of more importance than equal coldnes in both extremities.

Palpation of the peripheral vessels offers a fair and simple criterion of circulation in the extremities. One, however, must be careful of many chances for error. Anatomical anomalies, in which the vessels are out of their normal position, marked subcutaneous fat, or a weak myocardium will often be the causes for failure to palpate the vessels.

Palpation is done at four sites. The femoral is palpated below the middle of Poupart's ligament, the popliteal in the popliteal triangle, the posterior tibial below the internal malleolus and the dorsal pedal on the dorsum of the foot.

As we have stated before, many mechanical adjuncts have been developed to aid in the detection of circulatory disturbance. These must always remain adjuncts and take a secondary place to a careful examination with the eye and hand.

The use of the histamine reaction, oscillometer and skin thermometer are the few to be discussed here.

Injection of histamine phosphate, 1-1000 solution, intradermally reveals the status of the superficial circulation. Injection is made intradermally and in, as a rule, four specified areas: the dorsum of the foot, just above the ankle, at the level of the tibial tubercle and just above the knee. The typical reaction is the development of a flare similar to the wheal of urticaria, with pseudopodia and at times a bluish ring at the periphery. In the presence of insufficient

superficial circulation, there is absorption of the injected solution without the development of any flare, or only a small flare without pseudopods.

The oscillometer is a comparatively recent instrument developed for accurate measurement of the amplitude of peripheral pulsation. The instrument consists of an adjustable cuff which may be inflated, and two indicating dials. One dial records the pressure in the rubber cuff in centimeters of mercury, and the other records the rhythmic variations in pulsation over a scale graduated in centimeters of water.

The oscillometer gives one the pulsation index and the status of the deep circulation in the extremities. The value of this test lies in a comparative study of both extremities, as there are great normal variations in different patients. The normal oscillometric curve is peaked, whereas in arterial disease there is a definite flattening to complete obliteration of this curve. Recent work has increased the accuracy of this instrument by comparing the index of the upper and lower extremities at similar levels. The normal ratio of pulsation is 1-2 and, as the vessels of the upper extremity are much less frequently involved, one factor in this ratio remains fairly constant. Disturbance of this normal 1-2 ratio is then more accurate than comparison of the lower extremities alone, especially if depression of the index is equal in both. Even with this new work, use of the oscillometer must at all times be considered only as an adjunct to careful examination, as it is not fool-proof.

Use of the skin thermometer at times gives information as to mild changes in circulation. Here again, many factors must be considered. Examination should be made only after exposure of both extremities to room temperature for twenty to thirty minutes. Detection of vasospastic elements in conjunction with organic obliterative disease may be made by recording the skin temperature before and after peripheral nerve block or after immersion of the upper extremities in warm water for ten to fifteen minutes. The temperature readings are as a rule toe temperatures.

Differential diagnosis between these two conditions has to do mainly with the age of the patient and the duration of the symptoms. The patients with arteriosclerosis are as a rule elderly and have had symptoms usually for weeks or months, while those suffering with thrombo-angiitis obliterans are as a rule under forty-five years of age and give a history of symptoms over a period of years. Thrombo-angiitis obliterans is limited almost entirely to the male, reports of the condition in the female being rare and even questioned by many authors. The early development of arteriosclerosis in the diabetic must be considered, as here we see patients forty-five years or younger. Racial differences are marked in the two conditions, as the great majority of cases, though not all, of thrombo-angiitis obliterans occur in the Hebrew race, while arteriosclerosis obliterans is no respecter of race. Development of a migratory phlebitis which is superficial and not accompanied by any fever or leukocytosis occurs in approximately 30 per cent. of the cases of thrombo-angiitis obliterans and never in arteriosclerosis.

Pathologically there is a great difference in the two conditions. While arteriosclerosis obliterans involves the arteries alone, thrombo-angiitis obliterans involves either the artery or vein and usually both. The condition is one of degeneration in arteriosclerosis obliterans, and involves either the intima or, as in Mönckeberg's sclerosis, the media, while thrombo-angiitis obiterans is considered inflammatory in nature.

The treatment of these conditions with their complications of severe pain and gangrene may be divided into two types, namely, conservative and radical, conservative treatment being stressed here. The treatment in either condition is to a great extent identical, varying only to a slight degree.

Treatment of the uncomplicated case is as a rule ambulatory and its active part rests entirely with the patient. The seriousness of the condition must be stressed and in many instances the patient must early change his mode of living. The general care of the patient and his extremities is of prime importance. All general complicating conditions such as diabetes must be rigidly cared for. Tobacco in all its forms should be eliminated, if the patient is one addicted to its use. Conclusive evidence has been presented by many authors to show the deleterious vasospastic effect of nicotine. Care of the feet and legs is essential and should be thorough. Well fitting roomy shoes should be advocated, and at times linings of sheep skin used, especially where the individual leads an outdoor life. The patient must be warned as

to injury of the feet and should be counseled to consult his physician for even the most trivial injury, as this may precipitate gangrene. Bed socks are of value, being much safer than heating pads so often used. Daily sitz baths are advantageous and constitute a simple method of increasing peripheral circulation.

The aim of all treatment is to aid and hasten the development of collateral circulation. For the most part this treatment is mechanical.

Medication is used to some extent and consists of vaso-dilator drugs, of which the best and most generally used is phenobarbital-theobromine compound, grains vii ss, three times daily. Hypertonic salt solution 3-5 per cent. intravenously is used in amounts varying from 100 to 250 cc. every other day. Typhoid vaccine is given intravenously beginning with small doses and gradually increasing to just below the dose causing generalized reaction and this dosage cotinued once or twice a week.

Mechanical treatment varies from postural exercises requiring no apparatus to a motor tilting bed developed recently.

Postural exercises have a definite place in the uncomplicated case, but should not be used in cases with ulceration or gangrene or if pain follows. The act of elevating the extremities, flexing the ankles, etc., uses some of the vital oxygen in cases of gangrene. These exercises as to time element vary for each patient. The patient should lie flat on his back in bed and elevate the legs to 45 degrees. The ankles should be flexed and extended rapidly, the time consumed for blanching and emptying of all the veins noted. This is recorded, averaging as a rule two minutes, and is the standard time for elevation in that particular patient. The position is now changed so that both legs hang over the side of the bed in the sitting position and the time necessary for the appearance of rubor noted, being an average of three minutes. The third position is one of recumbency and should be the total of the first two phases of treatment. The three phases constitute one cycle of treatment and should be repeated four to five times in succession, twice to three times daily.

Passive venous hyperemia instituted with a special cuff of ordinary sphygmomanometer is by far the simplest and most effective of all. With the limbs horizontal, the cuff is placed at midthigh and inflated to 70 to 80 mg. in average cases. The time for the appearance of rubor and distention of veins is noted and used as standard, two minutes being average. Elevation with the cuff released for one minute and recumbency for twice elevation and distention constitute a cycle as in postural exercises. Three to four cycles twice to three times daily are sufficient.

The Pavex machine fills and empties the vessels of the extremity by vacuum and pressure, but is expensive and no more effective than the above treatment.

All the above can be carried out and the patient continue his or her daily work. In cases complicated by ulceration, gangrene or severe pain, other factors enter into the treatment. Absolute bed rest preferably in the hospital is essential. The position in bed should not be absolutely horizontal, but the circulation should be slowed somewhat by elevating the head of the bed two to three inches. Cessation of tobacco is even more necessary now than ever, and can mean the difference between success and failure. The severe pain oftentimes is relieved by bed rest alone; if not, injection of 1 to 5 cc. of deinsulinized pancreatic extract as a rule will be effective. As a last resort, peripheral nerve block or section may be necessary.

The traditional heat cradle should be discarded and the heat of the limb preserved by wrapping in layers of wool or cotton. With the heat cradle two major objections arise. First, likelihood of injury, *due to the patient striking his extremity against the cradle.* Secondly, the abnormal amount of heat present. In tissues deprived of their circulation, the normal hyperemia which occurs in response to heat to cool the part is not present, and further destruction ensues.

Postural exercises are contraindicated in the treatment of these complicated cases, but the cuff, pavex or tilting bed are of great aid to healing and preventing extension of the tissue destruction. Hypertonic salt solution, 3-5 per cent. daily is of great value. There is a mild generalized reaction of weakness with this solution and it must be used cautiously in arteriosclerotics.

Cases of dry gangrene should be kept so if possible, dry dressings and wrappings of cotton or wool being used. In infected gangrene, wet dressings either of boric or chloramine may be used. Separating tissue may be gradually teased loose and removed.

Acute embolical occlusion presents an absolute emergency. Here again, we may divide treatment into conservative and radical. Radical treatment consists of embolectomy, which in the hands of some has been very successful, but is difficult in the main, due to exact location of the embolus. Conservative treatment must also be early treatment. Papaverine HCL, gr. ½ intravenously, within the first three to four hours after the occlusion overcomes the secondary vasospasm. Oral doses, gr. ½, should follow at intervals of two hours.

There is no thought here of holding out a panacea and discarding surgery, but an attempt has been made to show the value of early diagnosis and conservative treatment. The social and economic status of the patient influences treatment here as elsewhere in medicine and at times amputation and early return to work is best. On the other hand, most of the treatment ment may be carried out in the patient's home if necessary.

If surgery is resorted to, it should be radical, amputation being done well above the gangrenous area, and not piecemeal around the infected or gangrenous areas.

With hard work and cooperation by both patient and doctor, often limbs can be saved and used, rather than confined to jars in pathological laboratories.

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NITROGEN THERAPY IN SCHIZOPHRENIA

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Since the introduction of the newer therapies of schizophrenia, many investigators have studied the manner in which the agents employed act on the organism, in order to establish a rational basis for the treatment of functional psychosis. At the present time the anoxia theory is in the foreground, because a state of anoxia is present in all the shock therapies.

Weil[1] and his co-workers pointed out that most of the changes observed in the ganglion cells after experimental hyperinsulinism are probably due to an intracellular anoxia. Gellhorn[2] found that in insulin, metrazol, dauerschlaff, sodium cyanide and carbon dioxide therapies a depression of the oxidative processes in the brain is common to all. During hypoglycemic shock therapy the normal brain metabolism is disturbed and depressed due to the lack of oxidative substances.

Holmes[3] and Wortis[4] showed that the oxygen consumption of sliced brain tissue parallels the concentration of the dextrose in the medium. In the administration of metrazol therapy it is quite evident to the observer that a state of anoxia is being produced which is especially marked at the end of the epileptiform seizure. According to Himwich[5] and his collaborators the oxygen tension in the arterial blood falls rapidly during a metrazol convulsion and a relative anoxia prevails for a period of time.

Inhibition or depression of oxidation in the brain by barbiturates and sodium cyanide was pointed out by Quastel and Wheatley[6], Jowet and Quastel[7]. It is evident, therefore, that these therapies which seem to be of some benefit in schizophrenia produce a relative state of anoxia. According to Gellhorn[2], the shock therapies produce a more severe anoxia than those previously employed. The same author states that the probable therapeutic factor of metrazol therapy is a stimulation of the sympathetic nervous system. Such a stimulation was shown by him[8] experimentally on the nictitating membrane of the cat, and clinically by Heilbrunn and Liebert[9] by the increase of adrenalin output during the various stages of insulin and metrazol therapy. If the anoxia really is the necessary condition which must be produced in order to obtain beneficial results in functional psychosis, it is evident that this might be produced by a less strenuous and less hazardous method than metrazol or insulin. For this reason, Himwich[10] brought about a state of anoxia by the inhalation of pure nitrogen at the expense of oxygen. This author reported favorable results in schizophrenic patients with this form of therapy, while other clinics could not confirm his findings. (Fraser and Reitmann[11])

Therapy with pure nitrogen inhalation was instituted at Elgin in order to compare the results of this form of treatment with those obtained with metrazol and insulin. This is a preliminary study of 11 cases treated.

Method: Pure nitrogen gas is inhaled by the patient with the aid of an ordinary McKesson

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and Robbins gas machine; this apparatus has a tight fitting mask to which an exhalation valve is attached. The exhaled gas is freed from carbon dioxide by soda lime which is connected in series with a breathing bag. Unconsciousness usually intervenes within 1½ to 2 minutes without excitation or distress. The period of anoxia is extended until oposthotonos and myoclonic twitchings occur. At this point the pupils are markedly dilated and there is a cyanosis of the face. The anoxia is then rapidly interrupted by the administration of pure oxygen; recovery is rapid and the patient is in contact within ten to fifteen seconds. Treatment was given three times a week for a total of fifteen treatments.

Materials: Altogether 11 cases of schizophrenia were treated; eight of these were of relatively recent onset; overt psychotic symptoms were noted for not more than six months. The remaining three patients had displayed psychotic symptoms for 12, 14, and 36 months. They were all classified by the staff as dementia praecox; four of them were of the catatonic type, three paranoid, and four undetermined. None had had previous therapy. The ages ranged from 22 to 37, and all were males.

Results: No untoward effects of the treatment were noted; there were no fractures or deaths; none of the patients objected to the treatment; this being in contrast to emotional reactions experienced during metrazol treatment. On the contrary they showed heightened mood and some euphoria immediately following the treatment. Also they became more talkative after the treatment which was especially noted in a mute catatonic. After each anoxic state, he talked freely for a period of several minutes and this period extended even longer with each successive treatment. In spite of the fact that all patients showed some response to the treatment, only one made a complete remission. This patient was 36 years of age, on admission was resistive, at times appeared perplexed; he displayed a lack of interest in his surroundings, usually sat off by himself, lacked spontaneity, and had shown symptoms for three years prior to admission to the hospital. With each treatment he showed some improvement and after fifteen treatments had been given, no overt psychotic symptoms were noted; he had good insight, and at the present time is home on parole. According to his family, he continues to get along well; in fact, they say he is better now than at any time previous to his illness. Besides this one patient, we did not have any recoveries or marked remissions. Eight others have completed the treatment, of whom six are considerably improved; that is, they are now making a better institutional adjustment and no longer express delusional ideas. However, they still display a typical residue seen so often in schizophrenics; namely, a lack of interest, no ready spontaneity and no insight. Two were not benefitted by the treatments and two who have received nine treatments are considered to be improved. Therapy in these two cases is still in progress.

During the period of anoxia and shortly thereafter some physiological changes have been noted; marked dilatation of the pupils, an increase in blood pressure, especially systolic — on the average of 60 mm. of mercury — while the diastolic did not increase to the same extent. The pulse frequency was markedly increased and ranged between 100 and 120 shortly after the treatment. Respiration also showed an increase up to 30 and 34. All this is evidence of a marked stimulation of the sympathetic nervous system and severe anoxia.

Comment: It can be seen from our results that the remissions obtained with nitrogen are not so frequent as those treated with insulin hypoglycemia and metrazol. In spite of the fact that the cases treated were recent in onset, only one patient was able to leave the institution. However, it is possible that a longer treatment with more frequent application may improve the remission rate. We are somewhat reluctant for the sake of the patient to extend this form of therapy, which is still in the experimental stage, for too long a time, because we might expect remissions with insulin if the psychosis of the patient is of fairly recent origin. However, there is no doubt but that psychotic behavior can be influenced by the anoxic state produced by nitrogen inhalation as evidenced by the quick responses in our heretofore mute patients and by the subjective expressions of well-being. Unfortunately this period of improvement is of very short duration, not even as long lasting as is sometimes seen after metrazol convulsions. We therefore hesitate to recommend this treatment in the form now used.

Theoretically the lucid interval after the

anoxic period is of great interest, since it shows that the patient can be aroused by a marked stimulation of the sympathetic nervous system.

Many authors claim that dementia praecox is a disorder of the autonomic nervous system. Many observations indicate that patient respond inadequately and insufficiently to stimuli. Singer[12], Hoskins[13], Cannon[14]. However, it seems rather questionable whether or not a stimulation of the sympathetic nervous system alone is sufficient in itself to produce lasting remissions since the failure or inadequacy of the response cannot be removed by stimulation alone without re-organization of the biological person. We have tried nitrogen therapy, and are continuing its use chiefly because we hope to gain a better understanding of the other therapies which give better results at the present time, and not because we believe that nitrogen inhalation, as used now, will replace them.

SUMMARY AND CONCLUSIONS

1. Eleven cases of schizophrenia were treated by the production of anoxia with nitrogen. One patient made a good remission; six showed a better institutional adjustment with no evidence of delusional ideas at the present time, though without insight. Two did not benefit by the treatment; while still in two others, treatment had not been finished.

2. A state of anoxia produced by inhalation of nitrogen is followed by a short lucid interval.

3. At the present time more frequent application of the therapy is recommended only for investigative purposes.

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Dr. I. Finkelman, Chicago: I was very much interested in this good piece of work. By listening to Dr. Lengyel I tried to make some mental notes. The Chairman introduced this subject as shock therapy. We have already insulin, metrazol, cyanides, electric convulsions, and various other methods of shock therapy. I am not trying to be facetious, but it is interesting that we can get an historical perspective of shock therapy. In 1854 Ray treated patient with ether jags, and that may be similar to the use of nitrogen. In 1855 Tyler used shock therapy and said that in order to treat the fundamental disease one has to produce a shock on the nervous system, and he did that. He did not have our advantages but produced it by causing emesis with ipecac and antimony and causing continuous catharsis with calomine, jalop, salts and senna, at the same time putting blisters on the patient's back. The oldest psychiatrists knew of the lowering of patients into pits with snakes, just near enough to produce a shock; or there was the custom of lowering the patient's head in water for some time. Rush used a gyrator to cause anoxia by sending the blood from the head to the extremities by rapidly centrifuging the body.

It is interesting that in nitrogen therapy of schizophrenia there is first unconsciousneess and then later mild clonic twitchings. It is not the anoxia that produces the mild convulsions. It is the toxic products that are formed. When the circulation is released, the toxic products go to the brain and there are produced convulsions. It is not the electric current but the toxic products that causes convulsions.

I want to touch upon the theory propounded by Gellhorn. He concluded that since insulin and metrazol caused an anoxia and since anoxia stimulates the sympathetic nervous system and since you get remissions by this process, therefore there is a disturbance in the autonomic nervous system. That may or may not be so, but the evidence that is brought forth is of very indirect nature. We think in dementia praecox there is a disturbance of the autonomic nervous system. But, as Lengyel has said, by stimulating this system you do not get remissions. To the physiologist a case of schizophrenia is not unlike that of diptheria or pneumonia. The psychiatrist has a different conception of this problem. You might conclude that in depressions there is a disturbance of the autonomic nervous system because metrazol causes remissions.

That may or may not be so, but we should have direct evidence for that.

I should like to say that if after nitrogen therapy the patient is happy, why not try that form of treatment on depressions; those are the patients you want to make happy and jovial.

THE CONTINUOUS ALTERNATING SCHEME OF TREATMENT IN THE CONTROL OF ACQUIRED SYPHILIS

R. A. VONDERLEHR

Assistant Surgeon General U. S. Public Health Service

WASHINGTON, D. C.

Aware of the potential value of the arsphenamines, the physician in general practice has long desired a tested, effective routine for using them. He has wanted a scheme of treatment with which he could confidently assure his patient a chance of recovery but which would not require a life-long period of treatment-observation. Every physician has seen syphilitic lesions disappear almost before his eyes. He has observed the arsenical compounds reverse the blood reaction within the first month or two or treatment. But he should always remember that a little treatment is not enough. Too often the patient has seemed to be entirely cured, when suddenly in the prime of life he is struck down by an aneurism or by general paralysis. How long should treatment be continued? When is it safe to permit the patient to begin a rest period?

In 1928, the Health Organization of the League of Nations began an investigation into the effectiveness of treatment schemes for syphilis used in several countries. Stokes, the American consultant to the League group, has commented upon the difficulties in making this international investigation. They arise from diversity in therapeutic theory and practice, drugs, and clinical and serologic technic, as well as from the almost insurmountable obstacles of language and distance which hinder free consultation and discussion. Believing that data from the clinics of the United States would be somewhat easier to evaluate because of uniformity in several important particulars, five clinics in this country pooled their records and experience and, with the aid of the U. S. Public Health Service, began a joint study of their treatment methods.

Read before Section on Public Health and Hygiene, Illinois State Medical Society, May 21, 1940, Peoria.

RELATIONSHIP OF TREATMENT TO CONTROL

These studies, which became known as the Cooperative Clinical Group investigations of the treatment of syphilis, proved that the control of early syphilis depends upon adequate and continuous treatment. Within 24 hours after the first injection of arsphenamine, the spirochete is gone from the early lesion. The lesion itself disappears within five to ten days. Continued treatment prevents subsequent mucocutaneous (communicable) relapse. Finally, uninterrupted, protective treatment will forestall the late manifestations of the disease — heart, nerve and bone syphilis.

The critical time in the prevention of mucocutaneous (communicable) relapse seems to come between the 15th and 19th injection of arsphenamine. This being so, community health is usually protected by 20 injections of arsphenamine with an equal number of injections of heavy metal for the patient with early syphilis. A similar critical time for forestalling neuroprogression and other late manifestations seems to come after additional treatment — from the 21st to the 29th injection of arsphenamine. The patient's welfare demands, therefore, that at least 30 injections of arsphenamine plus at least an equal amount of heavy metal be administered. If such treatment is given to protect the patient against future relapse or progression, good public health work is done at the same time.

DESCRIPTION OF THE CONTINUOUS-ALTERNATING SCHEME

The continuous-alternating scheme of treatment for early acquired syphilis which was found to be the most efficacious through the Cooperative Clinical Group investigations may be defined as follows:

1. Treatment is continuous. No rest periods from treatment are permitted during the first year.
2. Courses of an arsenical compound and a heavy metal are administered alternately, beginning with the arsenical compound and ending with the heavy metal.
3. The optimum requirements are at least 30 injections of arsphenamine and 40 of bismuth, given within 15 months.
4. Treatment should be continued for at least one year after disappearance of all significant signs and symptoms of the disease.

OTHER TREATMENT SCHEMES

In addition to continuous treatment as described above, other widely used treatment schedules may be roughly divided into three groups. The American intermittent scheme permits authorized periods of rest extending for one month or longer after the first or second course of treatment. An adequate intermittent schedule includes at least 30 arsphenamine injections plus an appropriate amount of heavy metal within 21 months' time. It should be pointed out that the Danish and British intermittent schedules which were analyzed in the League studies more closely resemble the American continuous scheme than the American intermittent scheme.

The intensive scheme of treatment is based on the old Schultz-Pollitzer schedule. It is characterized by brief courses and massive doses of arsphenamine early in treatment with long intervening courses of heavy metal. Finally, irregular treatment is any method which apparently follows no set schedule. The most common pattern of irregular treatment is established by the non-cooperative patient.

INFLUENCE OF SCHEME AND AMOUNT OF TREATMENT ON THE COURSE OF SYPHILIS

The Cooperative Clinical Group studies permit us to measure individually the influence of scheme and amount of treatment upon various types of relapse and progression. Mucocutaneous (communicable) relapse is likely to occur from three to 13 times more frequently under other schemes of treatment than under continuous therapy (table I). A rest in treatment of more than one month during the first year will increase the likelihood of mucocutaneous relapse by four times. At the time of the first discussion of treatment with the patient, it is necessary to impress upon him the importance of faithful attendance. Irregularity in treatment for early syphilis should be avoided at all costs.

Admissions of patients with neurosyphilis to mental institutions may be charged either to no treatment at all or to inadequate or irregular treatment during an earlier stage of the disease. Simple arithmetic proves that it is cheaper to prevent involvement of the central nervous system than to pay for later institutional care. This is one of the potent arguments that has led to widespread public and legislative approval of the venereal disease control program.

Continuous treatment is 50 per cent more effective in reducing the occurrence of neurorelapse and progression than other schemes. There seems to be little significant difference in the chance for clinical progression to cardiovascular and late skin or bone manifestations of the disease, between the continuous, intermittent and intensive schemes of treatment. Irregularity in treatment, however, increases the chance for such progression at least four-fold.

The second treatment factor in the control of acquired syphilis is the amount of treatment (table 2). The tendency toward mucocutaneous (communicable) relapse is reduced at least seven times in patients receiving 20 or more arsenical injections with interim heavy metal over those receiving less than this amount. The tendency toward persistent positive serologic tests is reduced by 40 per cent in patients receiving this protective therapy.

The Cooperative Clinical Group studies show that the arsphenamines have a definite effect in preventing neurosyphilis, since with patients receiving less than 20 doses there is three times as much chance that neurosyphilis will develop as with patients receiving more than this amount. Furthermore, we have seen that the scheme of treatment is a very important factor in reducing incidence of neurorelapse. Irregularity must be avoided.

The difficulty in testing treatment methods for syphilis lies in the insidious nature of the disease, which in turn demands extended periods of observation. Cases, however, are available from the Cooperative Clinical Group material which have received adequate and continuous therapy and at the same time have been under treatment-observation from two to ten years. The results shown for adequate continuous treatment — that is, at least 30 injections of an arsenical compound and accompanying heavy metal within 15 months — indicate maximum efficacy (table 3). These results are contrasted with those from adequate intermittent and from irregular treatment in patients observed for the same length of time.

Because of recent developments in serologic technic the two to ten year case records have been divided into those patients treated before 1930 and those treated after that year. Comparison of serologic results between earlier and later groups of patients under treatment for one year or longer indicates that there is from two

to three times as great a tendency toward serologic relapse or resistant serologic tests with present-day technics as with those in use a decade or more ago.

It should be pointed out that many of the patients with resistant serologic tests had a history of early central nervous system involvement as indicated by abnormal spinal fluid at the beginning of treatment. In all except three instances this abnormality disappeared under adequate routine chemotherapy.

In terms of clinical relapse there is no significant difference between pre-1930 and post-1930 groups. The irreducible minimum number of clinical relapses seems to be about one relapsing patient for every 40 patients treated.

Even adequate intermittent therapy doubles the chance for clinical relapse as compared to the adequate continuous-alternating scheme, while irregularly treated patients observed for the same period show five times as many clinical relapses.

The fact that only five out of 315 patients given adequate continuous treatment developed any form of mucocutaneous (communicable) relapse is remarkable evidence that the present-day control of syphilis lies in proper treatment.

THE NEED FOR EARLY TREATMENT AND COOPERATION OF THE PRIVATE PHYSICIAN

If therapy is begun in the secondary stage of syphilis, the patient has already passed through the extremely communicable primary stage of the disease in which 100 per cent are infectious. Each week of delay in beginning treatment in the primary stage increases the probability of spreading syphilis. Conversely, each week of treatment begun during the primary stage results in more effective control and isolation of the infection.

From 50 to 80 per cent of untreated primary cases develop communicable secondary symptoms. When primary patients are placed under adequate continuous alternating treatment immediately, the chance of infectious relapse can be reduced to about 1.5 per cent.

Treatment begun during the primary stage also offers a more favorable prognosis for the patient than treatment begun during the secondary stage (table 4). In comparing the ultimate outcome for patients treated in the various stages of early syphilis, we find that the probability of progression and relapse rises in proportion to the duration of infection. Of 3,244 patients, serologic relapse occurred in 6 per cent of those placed under treatment in the sero-negative primary stage, in 10 per cent of those in the sero-positive primary stage and in 11 per cent of those with secondary syphilis. The trend of clinical relapse, neuroprogression, and the tendency toward serologic fastness is similar. In other words, the chance for recovery seems inversely proportional to the duration of infection at the time treatment is begun. From every standpoint treatment should be started as soon as the diagnosis can be established.

Application of the treatment method to control, cannot of course, begin until the patient presents himself to his physician. Unfortunately, the patient does not come in for treatment at the first sign of syphilis. Fewer than ten per cent of persons infected go to their physician at all during the primary stage. Of those who do, less than half come for treatment within the first five weeks after the appearance of the chancre. As many as seven per cent of patients who eventually go to their doctor wait three months or more before becoming sufficiently concerned about the persistence of the sore to seek medical advice. During this period of communicability the patient, unaware of his condition, may repeatedly expose his sexual partner to the disease.

It has often been demonstrated that more early syphilis is seen by the private practitioner than by the specialist in the syphilis clinic. Patients do not go to their doctor with a diagnosis of syphilis already made. They go because of a persistent sore or falling hair or a skin rash. The physician must recognize the syphilitic infection. *He* must know that syphilis masquerades in many forms, and *he* must always suspect syphilis until it is definitely ruled out. The darkfield examination and the routine serologic blood test are of the greatest aid to the physician in general practice. With early diagnosis and protective, continuous treatment the patient suffering with syphilis has better than a ten to one chance for recovery while the community is protected at the same time from spread of the disease. Herein lies the secret of the control of syphilis.

TABLE 1

Influence of scheme of treatment upon tendency for clinical relapse of 3,244 cases of early syphilis.

Scheme of Treatment	Total Patients	Resistant serology or serologic relapse No.	%	Muco-cutaneous relapse No.	%	Neuro-relapse No.	%	Other late relapse No.	%
Continuous	1,502	209	13.9	46	3.1	266	17.7	38	2.5
Intermittent	1,165	605	51.9	142	12.2	306	26.3	21	1.8
Irregular	444	405	91.2	176	39.6	125	28.2	41	9.2
Intensive	133	63	47.4	12	9.0	54	40.6	1	0.8
TOTAL	3,244	1,282	39.4	376	11.6	751	23.2	101	3.1

Note: Totals above include all patients treated under given scheme of treatment without regard to adequacy of treatment or length of observation period at conclusion of treatment.

TABLE 2

Influence of amount of arsphenamine treatment upon tendency for clinical relapse in 2,889 cases of early syphilis with more than six months' treatment.

Amount of Arsphenamine	Total Patients	Resistant serology or relapse No.	%	Muco-cutaneous relapse No.	%	Neuro-relapse No.	%	Other late relapse No.	%
Little	1,793	558	31.1	266	14.8	170	9.5	82	4.6
Much	1,096	210	19.1	22	2.0	37	3.4	19	1.7
TOTAL	2,889	768	26.6	288	10.0	207	7.2	101	3.5

Note: "Little" indicates 1-19 injections of arsphenamine; "much" indicates 20 or more injections.

TABLE 3

Influence of adequate treatment upon tendency for relapse in 1,816 cases of early syphilis observed from 2 to 10 years.

Scheme of Treatment	Total Patients	Serologic relapse No.	%	Muco-cutaneous relapse No.	%	Neuro-relapse No.	%	Other late relapse No.	%
Treated before 1930:									
Adequate Continuous	143	11	7.7	2	1.4	—	—	—	—
Adequate Intermittent	142	12	8.5	4	2.8	1	1.7	1	1.7
Irregular	1,209	160	13.2	60	5.0	79	6.5	39	3.2
Treated after 1930:									
Adequate Continuous	172	39	22.7	3	1.7	3	1.7	2	1.2
Adequate Intermittent	57	17	29.8	3	5.3	1	1.8	—	—
Irregular	93	41	44.1	8	8.6	2	2.2	1	1.1

TABLE 4

Influence of stage of syphilis during which treatment began upon tendency for relapse at conclusion of treatment, in 3,244 cases of early syphilis.

Stage of early syphilis during which treatment began	Total Patients	Clinical Relapse except Serologic relapse No.	%	Neuro-relapse No.	%	Neuro-relapse No.	%	Resistant Serology No.	%
Seronegative Primary	342	22	6.4	9	2.6	6	1.8	9	2.6
Seropositive Primary	585	58	9.9	16	2.7	23	3.9	41	7.0
Secondary (first year)	2,252	242	10.7	65	2.9	98	4.4	176	7.8
Secondary (delayed)	65	7	10.8	3	4.6	5	7.7	9	13.8
TOTAL	3,244	329	10.1	93	2.9	132	4.1	235	7.2

DISCUSSION

G. G. Gaylor, M.D., Chicago: Dr. Vonderlehr has very clearly shown that the best results from treatment of acquired syphilis may be expected from the continuous alternating plan. Actual experience with this method in a large clinic has convinced me that it offers the best possible results, with fewer reactions, in the average case of early syphilis, provided the treatment can be made really continuous.

No treatment can be continuous without the cooperation of the patient. To obtain the required cooperation, the patient must be made to understand the nature of his disease, the danger of exposing others in the early stages, and as a result of a relapse, the necessity for uninterrupted and prolonged treatment, and the serious consequences which may befall him in later life as a result of neglect and indifference in the first year of his treatment.

The confidential nature of venereal disease records and reports should be made clear to him. He should understand that so long as he continues to follow the advice of his medical adviser, he is nothing more than a number to the health authorities. The patient's complete confidence is essential to complete cooperation.

The physician must interest himself in the well-being of the patient in order to secure his confidence. Properly kept records, frequent tests, thorough examinations and good technique in treatment all help to inspire confidence.

Altruism is a marvelous virtue, but it doesn't pay the cost of living — the physician must charge for his services. Common sense will tell him that his fee must be commensurate with the patient's ability to pay if treatment is to be continuous.

Having secured the patient's confidence, having impressed upon him the seriousness of his illness, even though the symptoms have all disappeared, having reversed his positive serology, either because it is our custom or for some other reason, we decide the patient needs a rest period of a month. The patient concludes that his illness is not so serious as it was supposed to be, and perhaps the month becomes three or four months so that when he does come back, his serology has become positive and, equally unfortunate, he is now an indifferent patient. If he avoids a relapse, he has an excellent chance to become serologically "fast," which nearly always leads to loss of confidence in his medical adviser if not in all treatment. One actual case presents a good illustration of what may be expected from injudicious rest periods:

Patient started treatment in July, 1938.

Diagnosis: Syphilis, primary. Seropositive.

Had treatment twice weekly during the first six months and weekly thereafter. At the end of one year, he had had repeated negative Kahn tests after the third month of treatment, and had received a total of 28 injections of neoarsphenamine and 45 of bismuth salicylate in oil.

A spinal puncture at that time proved completely negative. He continued uninterruptedly until he re-

ceived eight more injections of neoarsphenamine and one of bismuth, when a three-month rest period was ordered, at the conclusion of which he received a Kahn test, the result of which was positive. Unfortunately, the clinician ordered another three-month rest period without waiting for the laboratory report. At the end of the first month the patient returned with a maculopapular eruption on the body, including palms and soles.

Progression diagnosis: relapsing secondaries.

Prognosis for cure: poor.

Such a case presents a strong argument for continuous (uninterrupted) treatment. It is well known that in a small percentage of cases relapse does occur, even after the best of treatment but, if the complete routine is given, the physician at least has a clear conscience.

Examinations required by the Illinois Marriage law have brought to light many cases of serologically-fast syphilis with a history of interrupted or discontinued treatment years ago.

Aside from carelessness or indifference on the part of the patient or his physician, drug reactions constitute the most important factor in causing interruptions in treatment.

Jarish-Herxheimer reactions are to be expected in florid cases. Most of them can be avoided.

Nitritoid reactions may not be entirely avoided, but the careful clinician will be able to detect the advance warning and stop his injection in time to prevent the severe type.

Mild skin reactions are of frequent occurrence, and should be regarded as danger signals. Dermatitis exfoliativa occurs far too frequently.

Severe skin reactions due to the careless administration of bismuth are far more frequent than generally believed.

Jaundice and even acute yellow atrophy may be avoided in most instances by the regular use of the icterus index.

All patients, receiving bismuth particularly, should have regular dental care. Unlimited laboratory service is also essential to the safe treatment of syphilis under any plan.

Reactions occasion not only interrupted treatment; they result in loss of confidence on the part of the patient. Complete physical examinations and frequent reexaminations, with regular laboratory check-up, will reduce severe reactions to a minimum and tend to promote continuous treatment.

All things considered, if a cure is the objective, as it is in all cases not too far advanced, the continuous alternating plan of treatment seems to be the safest and best.

518 Deming Place.

A scientist says it is the lower part of the face, not the eyes, that gives away one's thoughts. Especially when one opens the lower part of the face.—*Montreal Star.*

UNDULANT FEVER

Yesteryear—Infrequently recognized as a disease of humans.

Today—Now readily recognized and can be diagnosed by a specific blood test.

—Courtesy of W. F. Prior Company, Inc.
Fulton County Medical Society Bulletin.

The modern records of phenomenal prolificity indicate almost no instances of multiple births exceeding six (sextuplets). In older writings there is mention by credible authors of the simultaneous birth of from seven to fifteen fetuses. Pare cites in a case of an Italian mother who bore twenty children in two confinements, nine on the first occasion and the second time, eleven.

—*Medical Bulletin.*

Apropos the family doctor—"With a few questions, a snappy physical examination, he recognizes an attack of erysipelas or measles or acute cardiac failure. . . . He agrees with Mackenzie that, when one wishes a flat tire fixed, one resents the advice of the garage man that a thorough overhauling of the car is necessary."—*Herrick.*

"What shall I do?" wailed the sweet young thing. "I am engaged to a man who just simply cannot bear children."

"Well," remarked the kindly old lady, "you musn't expect too much of a husband."—*Nebraska State Journal.*

Boy: "Do you know, dad, that in some parts of Africa a man doesn't know his wife until he marries her?"

Dad: "Why single out Africa?"

Surgeons were greatly surprised to find a bolt, nut and washer in the brain of a Michigan man. It must have been their first experience in opening up a politician's head.—*Neb. State Jour. of Med.*

Hungry persons drive fast and dangerously, says a doctor. Also those who are no longer thirsty.—*Tampa Tribune.*

News of the State

OGLE COUNTY

Ogle County Medical Society held a meeting November 19, 1940 at the Spoor Hotel, Oregon, Illinois.

Election of officers: Dr. G. S. Henderson, Holcomb, President; Dr. Du Mont, Mt. Morris, Vice President; Dr. Bogue, Rochelle, Secretary and Treasurer; Dr. Kennedy, Rochelle, Censor-3 years.

Dr. C. Spencer Bond, Rochelle was voted a membership in the Society.

Harry Leichenger, M. D., assistant Professor of Pediatrics, University of Illinois College of Medicine gave a very instructive lecture on Poliomyelitis.

Dr. Ernest Breed gave a short talk and a motion

picture on the Radium Treatment of Birth marks.

Sincerely yours,

A. R. Bogue,
Secy. Ogle Co. Medical.

SOUTH SIDE MEDICAL ASSEMBLY

The South Side Medical Assembly will meet again this coming year, February 19, 1941 at the Shoreland Hotel. At this coming meeting all seven of the South Side Branches will participate to make it a bigger and better meeting. The Chicago Medical Society which normally meets on that date will cancel it's meeting downtown in order to hold their meeting in conjunction with the South Side Medical Assembly. Surgical Clinics will again be held at various hospitals and this will be announced at some time in the very near future. Work has been progressing very satisfactorily towards making the Assembly a most successful meeting. Mark the date in your appointment book now *FEBRUARY 19, 1941*, Shoreland Hotel.

COMING MEETINGS

January 3 — Will Grundy County — Louis Joliet Hotel, Joliet — 12:00 noon — Dr. Harry B. Mock — "Skull Fractures."

January 7 — Vermilion County — Hotel Wolford, Danville, 6:30 P. M. Dr. Jerome R. Head — "Lung Abscess."

January 8 — Clinton County — Truesdail Hotel, Carlyle — 12:30 Noon Dr. E. Lee Dorsett, St. Louis — "Vaginitis in Pregnancy."

January 8 — Beardstown Hospital — Beardstown — Dr. Fred M. Meixner — "Respiratory Infections."

January 8 — McDonough County — Macomb — Evening — Program on Syphilis — including Motion Picture "Syphilis, A Motion Picture Clinic."

January 10 — Greene-Jersey County — Evening

January 10 — Will Grundy County — Louis Joliet Hotel, Joliet — 12:00 noon — Dr. John S. Coulter — "Uses and Abuses of Physical Therapy."

January 14 — Lake County Medical Society — Abbott Laboratories, North Chicago — Evening — Dr. B. Barker Beeson — "Treatment of Syphilis in the Adult."

January 14 — Effingham County — Benwood Hotel, Effingham — 6:30 P. M. — Dr. F. E. Senear — "The Treatment of Common Skin Disorders."

January 14 — Alexander County — St. Mary's Hospital, Cairo — 8:00 P. M. — Dr. Franklin Corper — "Urinary Tract Infections & Nephritis."

January 14 — Kankakee County — Hotel Kankakee, Kankakee — 12:00 noon — Dr. Charles Newberger — "Forceps Delivery — Indications, Contra-indications, and Technique."

January 14 — Bureau County — St. Margaret's Hospital, Spring Valley — 6:30 P. M. Dr. A. Verbrugghen — "Neurology in General Practice."

January 14 — St. Francis Hospital, Peoria — 8:00 P. M. Dr. William Harcourt Brown — "Prolonged Labor."

January 16 — Stephenson County — Freeport — Dinner at 6:30 P. M. Dr. Frederick W. Slobe — "Low Back Injuries."

January 17 — Will-Grundy County — Louis Joliet Hotel, Joliet — 12:00 noon — Dr. Harold M. Camp.

January 21 — Rock Island — Moline Public Hospital, Moline — 8:00 P. M. Dr. Eugene Cary — "Management of Prolonged Labor."

January 24 — Saline County — City Hall, Harrisburg — 8:00 P. M. — Dr. H. Close Hesseltine — "Diagnostic Pitfalls of Pyuria and Fever in the Obstetrical Patient."

January 24 — Will-Grundy County — Louis Joliet Hotel, Joliet — 12:00 Noon Dr. John R. Neal — "Medical Legislation."

February 4 — Vermilion County — Hotel Wolford, Danville — 6:30 P. M.. Dr. Horace W. Soper of St. Louis — "Gastroenterology for the General Practitioner."

February 4 — Williamson County — Herrin Hotel, Herrin — 8:00 P. M. — Dr. Irving F. Stein — "Version and Forceps."

February 7 — Bond County — Thomas Hotel, Greenville — 7:00 P. M. — Dr. W. A. Malcolm — "Vanishing Toxemias of Pregnancy."

February 7 — Madison County — 2:00 P. M. (place not decided) Dr. William J. Pickett — "Ruptured Appendix."

February 11 — Kankakee County — Hotel Kankakee, Kankakee, 12:00 noon — Dr. R. E. Black — "Heart Disease in Children."

Marriages

ERNEST DE WITT RICHARD PONZER to Miss Elizabeth Parkin, both of Chicago, September 21.

WILLIAM EDWARD STEINER, Savanna, Ill., to Miss Marie Melanie Kolbus of Chicago in September.

Personals

The Chicago Gynecological Society was addressed, November 15, among others, by Drs. Milton H. Adelman and Benjamin B. Lennon on "Pituitrin Shock."

Dr. John Alexander, Ann Arbor, addressed a joint meeting of the Chicago Tuberculosis Society and the Illinois chapter of the American College of Chest Physicians, November 18, on "Management of Bronchiectasis."

Dr. Franklin G. Ebaugh, professor of psychiatry, University of Colorado School of Medicine, Denver, addressed a public meeting spon-

sored by the Chicago Medical Society in cooperation with the Chicago Pediatric and Neurological societies, December 11, at the Chicago Woman's Club. His subject will be "Your Mental Health."

The Chicago Council of Medical Women was addressed, November 13, by Drs. Mila I. Pierce, Evanston, on "Infections of the Newborn;" Louise O. Kappes, Evanston, "Allergy in Children," and Willie Mae Clifton, "Dietary Treatment of Phosphorus Retention in Renal Insufficiency."

The Chicago Urological Society was addressed, November 28, by Drs. Joseph H. Kiefer on "Tumors of the Testicle: Hormone Determinations in Diagnosis and Management;" Gustav Kolischer, "The Irritable Bladder," and Fay H. Squire, "Deep Roentgen Therapy in Elusive Ulcer of the Bladder: An Analysis of Twenty-Five Treated Cases."

The Chicago Laryngological and Otological Society was addressed, December 2, by Drs. Elmer W. Hagens on "Otosclerosis in Identical Twins" (case report) and Stuart C. Cullen, Iowa City, "Anesthesia in Otolaryngology."

The Des Moines Academy of Medicine and the Polk County Medical Society was addressed, November 20, by Drs. James Barrett Brown, St. Louis, on "Traumatic Surgery" and Andrew C. Ivy, Chicago, "Relation of Physiology to Modern Medicine."

Dr. Max Thorek addressed the Staff of St. Margaret's Hospital, Hammond, Indiana, December 3rd on "Electrosurgical Obliteration of the Gallbladder as a Means of Reducing Mortality" (Report of 1,044 cases).

Dr. Clifford J. Barborka gave a Post-graduate Lecture at Marshalltown, Iowa, December 3, 1940, for the Iowa State Medical Society. His subject was Vitamin Deficiency — Its Symptoms and Treatment.

Dr. W. W. Bauer addressed the doctors of Will-Grundy County Medical Society on the subject, "Health Education and the Medical Profession," at their noon meeting December 13.

Dr. Henry Buxbaum was the guest speaker at a meeting of the Knox County Medical Society the evening of December 10, speaking on "Indications of Therapy of Non-Obstetric Complication of Pregnancy."

Dr. Charles H. Phifer spoke to the doctors of the Madison County Medical Society, Alton, on December 7, at their Annual Meeting. He talked on "Medical Economics."

Dr. Michael Mason addressed the doctors of the Lake County Medical Society December 10 on the subject, "Surgery of the Hand."

Dr. William C. Beck gave a paper on "Differential Diagnosis and Treatment of Acute Abdominal Lesions" before the Fulton County Medical Society at Canton December 19.

The Chicago Society of Anesthetists elected the following officers for the coming year: President, W. H. Cassels; Vice-President Alice McNeal; Secretary-Treasurer, Rose Engel.

Dr. Robert S. Berghoff spoke over radio Station WJJD the morning of December 19, 1940, on the subject "You and Your Heart."

The following officers of the Institute of Medicine of Chicago for 1941 were elected by the Board of Governors, as follows: Honorary Chairman, Ludvig Hektoen; Chairman, William F. Petersen; President, Rollin T. Woodyatt; Vice-President, Edwin W. Ryerson; Secretary, George H. Coleman; Treasurer, Grant H. Laing.

News Notes

—A gift of $50,000 from Miss Edith L. Patterson, Sterling, Ill., as additional endowment for the Patterson cancer clinic at Passavant Hospital, Northwestern University, was recently announced.

—Dr. John de J. Pemberton, Rochester, Minn., discussed "Indications for Splenectomy and the Results of Operation" before the North Side Branch of the Chicago Medical Society, November 7. Dr. Albert M. Snell, Rochester, addressed the Evanston Branch, November 7, on "Recent Studies on Deficiency States and Vitamin Therapy" and Dr. Charles B. Puestow, "Relation of Vitamins to Surgery."

—Northwestern University has received $635,000 from the estate of the late Dr. John S. Appleman, it is reported; $135,000 is restricted to use of the medical school clinics. Announcement has also been made of a gift of $162,000 from the Clara A. Abbott trust for advancement of medical, chemical and surgical science. Mrs. Abbott, widow of Dr. Wallace C. Abbott, founder of the Abbott Laboratories in North Chicago, previously had given the university $1,500,000 for similar purposes.

—Northwestern University Medical School wish-

es to announce that the Mayo Lecture for 1940 will be delivered by Dr. Stuart W. Harrington on the subject of "Diaphragmatic Hernia," on Monday, February 10, 1941, at 1:00 P.M., in the Library of the Medical School at 303 East Chicago Avenue. All physicians are invited to attend.

—The Madison County Medical Society will be host at a postgraduate conference arranged by the state medical society for physicians in the sixth district in Alton, December 4. The following program will be presented by Chicago physicians:

Dr. Henry Close Hesseltine, Newer Endocrines in Obstetrics.

Dr. Lowell D. Snorf, Diagnosis and Treatment of Functional Disorders of the Colon.

Dr. Clifford J. Barborka, Medical Management of Gallbladder Disease.

Dr. Wilber E. Post, Arthritis.

Dr. Hillier L. Baker, Potential Inguinal Hernia with Special Reference to Direct Hernia.

Dr. Archibald L. Hoyne, Scarlet Fever.

Dr. Arno B. Luckhardt, Academic or Unsuccessful Research.

Dr. Warren H. Cole, Hyperthyroidism.

—The Sangamon County Medical Society held a joint meeting with the District Medical Society of Central Illinois at St. John's Hospital in Springfield, November 7. Participating in the program were:

Dr. Sidney O. Levinson, Chicago, Serum Transfusions or Blood Transfusions?

Dr. Frederick A. Jostes, St. Louis, Manipulative Treatment of Backache.

Dr. Louis H. Jorstad, St. Louis, Surgery or Radiation in Cancer of Skin and Mouth.

Dr. Ralph H. Major, Kansas City, Mo., Changing Picture of Therapy in Pneumonia.

Dr. Thomas D. Masters, Springfield, Chronic Peripheral Artery Disease.

Dr. Robert J. Patton, Springfield, Endometrioma of Sigmoid with Obstruction.

Dr. Henry S. Dickerman Jr., Springfield, The Thyroid Heart.

—The Graduate School of the University of Illinois has established four research fellowships to be awarded for one year in the fields of medicine and dentistry in Chicago at a stipend of $1,200 a year (calendar year with one month's vacation). Fellows are eligible for reappointment in competition with the new applicants. Candidates for these fellowships must have completed a training of not less than eight years beyond high school graduation. This training may have been acquired in any one of the following ways, or the equivalent thereof:

1. Work leading to the B.S. and M.D. degrees (in some instances the candidates would have the M.D. degree, or an additional year or two of hospital training beyond the intern year).

2. Work leading to the B.S., M.S. and D.D.S. degrees.

3. Work leading to the B.S. or B.A. degree in a four year collegiate course and to the D.D.S. degree.

4. Work leading to the B.S., D.D.S. and M.D. degrees.

Candidates should indicate the field of research in which they are interested and submit complete transcripts of their scholastic credits, together with the names of three former science teachers as references. March 1 is the deadline for acceptance of applications. Announcement of the fellowship awards will be made April 1, becoming effective September 1. Formal application blanks may be secured from the Secretary of the Committee on Graduate Work in Medicine and Dentistry, 1853 West Polk Street, Chicago.

—The Chicago Tumor Institute has issued a report of its activities for its first two years. Of 904 patients observed, 613 patients had cancerous lesions, while 301 had benign tumors, inflammatory lesions and other noncancerous conditions. It is of special significance, says the report, that of the 613 cancer patients 262, or 42.7 per cent, had far advanced cancers, and it is sad to reflect that the greater number were cases of accessible forms of cancer easily curable in early stages. Of the total number of patients, 622 were residents of Chicago, 140 came from cities in Illinois outside of Chicago, 130 from twenty-four other states and 12 from six foreign countries. Procedures carried out included 13,269 examinations, 8,846 roentgen diagnoses, 7,756 roentgen treatments, 4,432 radium treatments, 184 minor surgical procedures, seventy-eight surgical procedures, and the making of 278 photographs and lantern slides. An attempt is being made to pursue a five year follow-up of

all cancer patients treated at the institute and in the group of 904 observed only 1 patient remained untraced at the end of the first two years. Every patient who was treated has been traced. "Cancerphobia" is attributed to 34 patients of the 904 who came to the institute because of fear they were suffering from cancer. The disease was not found in any of this group. Seventeen, or 50 per cent, are classified as having general phobias, and of the remainder one third referred their complaints to the breast, one third to the mouth and one third to the gastrointestinal and genitourinary systems. In the first two years, two courses have been held and instruction has been given to forty-nine qualified radiologists, thirty-six from the United States and thirteen from foreign countries. Eighty physicians from thirty foreign countries visited the institute to study its organization and equipment and consult with the staff on various phases of the cancer problem. The institute was opened in March 1938 and the report covers the period ended March 31, 1940.

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Deaths

WILLIAM EDWARD BARTON, Bethalto, Ill.; Barnes Medical College, St. Louis, 1909; formerly health officer of Wood River; aged 60; died, October 15, in Roxana of carcinoma of the stomach.

CHARLES HENRY BEADLES, Oglesby, Ill.; Rush Medical College, Chicago, 1890; aged 73; died, October 2, in the Peoples Hospital, Peru.

JAMES ROSSER BEDFORD, Dahinda, Ill.; Rush Medical College, Chicago, 1881; Civil War veteran; aged 94; died, October 19, in Oneida of cerebral hemorrhage and pneumonia.

RICHARD W. CARTER, Chicago; Fort Wayne (Ind.) College of Medicine, 1893; aged 70; died, October 25, of chronic myocarditis.

CARL V. CRUSE, Iola, Ill.; Barnes Medical College, St. Louis, 1899; member of the Illinois State Medical Society; aged 67; died, October 12, of cardiorenal disease and arteriosclerosis.

ROBERT EUGENE FORSTER, Chicago; Magyar Királyi Erzsébet Tudományegyetem Orvostudományi, Pecs, Hungary, 1923; aged 40; was found dead, October 30, of poison, self administered.

WILLIAM HENRY HOLMES, Chicago; Northwestern University Medical School, Chicago, 1910; a Fellow, A.M.A.; professor of medicine at his alma mater; member of the Central Society for Clinical Research; served during the World War; on the staffs of the Wesley Memorial Hospital and the Passavant Memorial Hospital; author of a book entitled "Infectious Diseases;" aged 53; died, November 2, in Ann Arbor, Mich., of pulmonary and cerebral abscesses.

MORGAN BIDDLE JENNINGS, Streator, Ill.; Rush Medical College, Chicago, 1886; aged 77; died, November 16, in St. Mary's Hospital.

HENRY R. KRASNOW, Chicago; Chicago College of Medicine and Surgery, 1914; instructor of dermatology at the University of Illinois College of Medicine; aged 57; on the staffs of the Research and Educational Hospital and the American Hospital, where he died, October 31, of coronary thrombosis.

FREDERICK A. LUCE, Cicero, Ill.; College of Physicians and Surgeons of Chicago, 1892; aged 84; died, October 2.

CHARLES FREDERICK ROAN, Chicago; a Fellow A.M.A., University of Illinois College of Medicine, Chicago, 1928; on the staffs of the Augustana and the Lutheran Deaconess Hospitals; aged 41; died, October 12, of coronary thrombosis.

RAYMOND EUGENE ROBINSON, Chicago; University Medical College of Kansas City, Mo., 1913; served during the World War; aged 50; died, October 2, of pulmonary embolism.

JOSEPH A. ROTH, Chicago; Harvey Medical College, Chicago, 1905; aged 66; died, October 14, of diabetes mellitus.

JONAS RUBY, Chicago; Chicago College of Medicine and Surgery, 1917; for many years school health officer; aged 54; died, October 21, in the American Hospital of coronary occlusion.

ISAAC HOLLEN TAYLOR, Springfield, Ill.; Rush Medical College, Chicago, 1871; aged 90; died, September 27, of coronary occlusion and arteriosclerosis.

HARRY WILLARD WATEROUS, Galva, Ill.; Rush Medical College, Chicago, 1885; member of the Illinois State Medical Society; aged 81; died, October 24, in East Pepperell, Mass., of coronary occlusion.

MARION G. WILBUR, Chicago; Medical College of the State of South Carolina, Charleston, 1902; member of the Illinois State Medical Society; aged 68; died, October 8.

CHARLOTTE MARGARETHA SEKLER KOESTER, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; aged 69; died, October 2, of pancreatitis.

FREDERICK WOLTMANN, Kampsville, Ill.; Hahnemann Medical College and Hospital, Chicago, 1903; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; member of the Illinois State Medical Society; served during the World War; aged 64; died, October 7, in the Veterans Administration Facility, Jefferson Barracks, Mo., of melanotic sarcoma.

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